Commercial Fisheries Abstracts

a monthly summary of important developments for the fishery industries

In this issue—

- Shrimp Peeler — P. 1
- Small Craft Design — P. 3
- Fish Finder — P. 5
- Bluefin Tuna Exploration — P. 7
- Automatic Smoking — P. 13

— and 35 others

APR 1956
LIBRARY
FISH & WILDLIFE SERVICE

Vol. 9 No 3 March 1956

Fish and Wildlife Service
U.S. Department of the Interior
Washington D.C.

UNITED STATES
DEPARTMENT OF THE INTERIOR

DOUGLAS McKAY, Secretary

FISH AND WILDLIFE SERVICE

JOHN L. FARLEY, Director

Commercial Fisheries Abstracts

Prepared in the Branch of Commercial Fisheries

EDITORS

A. W. ANDERSON, Chief, Branch of Commercial Fisheries

DONALD Y. ASKA, Chief, Educational and Market Development Section

ASSOCIATE EDITOR

MAURICE E. STANSBY, Chief, Pacific Coast and Alaska Technological Research

ASSISTANT EDITORS

KATHRYN L. OSTERHAUG, Fishery Products Technologist, Seattle

F. BRUCE SANFORD, Chemist, Seattle

Applications for COMMERCIAL FISHERIES ABSTRACTS, which is mailed free to members of the fishery industries and allied interests, should be addressed to the Director, Fish and Wildlife Service, United States Department of the Interior, Washington, 25, D.C.

Fulfillment of foreign requests confined to Government agencies, research institutions, and libraries.

The Service assumes no responsibility for the accuracy of material from outside sources, and can fulfill requests for copies of the articles only if the abstract was taken from a Service publication. Readers should direct requests for other articles to the author of the article or to the publication in which it appeared. The addresses of these publications are available from the Fish and Wildlife Service, Washington 25, D. C., and will be sent to inquirers upon request.

The abstracts in this leaflet may be left in their present form; but it is suggested that to make the most efficient use of them, they be cut out on the lines designated and filed by the number in the upper left-hand corner of each. For a full description of this filing system see "Fishery Technological Abstract Card System" by Maurice E. Stansby and K. L. Osterhaug, Fishery Leaflet No. 232, obtainable free by request from Fish and Wildlife Service, Washington 25, D. C.

In addition to the regular abstracts, there is included a bibliography of references of secondary importance (without abstracts). These may be cut off on the lines designated and pasted on standard 3 x 5-inch cards for filing.

Following is a brief outline of this filing system. The numbers apply to the first digit appearing on each card. For the meaning of subsequent digits, please see the above described leaflet.

0	General and theoretical	5	Vitamins
1	Fish by species	6	Fishery byproducts
2	Fresh fish	7	Analytical Methods
3	Preserved fish	8	Composition
4	Oils	9	Miscellaneous

Issued with the approval of the Bureau of the Budget, December 29, 1953

1.10 PACIFIC ALBACORE FISHERY MOVES OFFSHORE

Clemens, Harold B. (Marine Fisheries Branch, California Department of Fish and Game)
National Fisherman 36, 17, 34 (October 1955)

The California albacore fishery is extremely variable from year to year and highly seasonal, being pursued only in the summer and fall. Information that makes predictions possible is necessary for stabilization and expansion of the industry.

The California Department of Fish and Game expanded its albacore investigation in 1951. They gathered data on and made studies of commercial catch localities, migrations, racial relationships, size at maturity, exploratory fishing methods, environment, and other factors that bear upon a continued high-level albacore harvest.

Most of the albacore landed in California since 1950 were taken during the months of July, August, and September between latitude 26° north and latitude 36° north from the coast out to longitude 125° west. Since 1950 the fishery has gradually shifted offshore (outside 150 miles). This trend started in August, 1951, and by August, 1953, the offshore area was the most productive.

Each year as the season progresses the fishery tends to move northward up the coast and offshore. By November most of the fish are taken north of Los Angeles harbor.

(over)

 ABSTRACTER: Kathryn L. Osterhaug

1.4 FREEZING AND COLD STORAGE OF PACIFIC NORTHWEST FISH AND SHELLFISH. PART V - PALATABILITY AND COLD-STORAGE LIFE OF BLACKTIP ROCKFISH (SEBASTODES ALEUTIANUS) AND FLAG ROCKFISH (SEBASTODES RUBRIVINCTUS)

Miyauchi, D. T. (Fishery Technological Laboratory, U. S. Fish and Wildlife Service, Seattle, Washington) and Alverson, D. L. (Washington State Department of Fisheries)
Commercial Fisheries Review 17, 17-18 (September 1955)

Twelve specimens each of blacktip rockfish and flag rockfish, caught by the U. S. Fish and Wildlife Service's vessel John N. Cobb and landed iced in excellent condition, were frozen in the round at Astoria, Oregon. The fish were then shipped to the laboratory at Seattle, Washington, where they were thawed and filleted. Three fillets of each species were used in the initial organoleptic examination; the remaining fillets were wrapped in MSAT[1/] cellophane, refrozen, and stored at 0° F. At intervals of about 2 months, 2 or more packages were taken from cold storage, and the fillets were examined organoleptically after being thawed and again after being cooked.

In the initial organoleptic examination of the blacktip rockfish, the fillets were judged normal in appearance, flat in flavor, slightly sweet in odor, and coarse, fibrous, but tender in texture. No change in quality was observed in the fillets after 2 months of storage. After 4 months, the fillets were sweet in odor and flat in flavor, and the surfaces of the fillets were moderately discolored. After 6 months, the fillets were poor in appearance, slightly rancid in flavor, and fair to poor in texture; they were judged unacceptable.

In the initial organoleptic examination of the flag rockfish, the fillets were judged normal in appearance, flat in flavor, slightly sweet in odor, and somewhat tough or rubbery in texture. Because

(over)

 ABSTRACTER: David T. Miyauchi

1.20 SARDINE RESEARCH LAB SET UP AT UNIVERSITY OF MAINE

Anonymous
Canner 121, 30 (September 5, 1955)

An agreement between the Maine Sardine Tax Committee and the University of Maine for a cooperative sardine industry technological research program was announced last month.

The committee's executive secretary, Richard E. Reed, said that work on several projects was already underway and that it was expected the agreement would result in the establishment of a permanent sardine research facility at the University.

A well-equipped research laboratory, partially financed by the committee, will be set up. Facilities of the Food Processing department also are being utilized.

The industry's research director, Dr. Berton S. Clark, with several assistants, is handling the sardine work with specific projects assigned on a contract basis to the Food Processing department, under the supervision of Dr. Matthew E. Highlands.

Mr. Reed said that the purpose of the program was to provide the industry with an aggressive program of research and development for fish handling, processing, quality control, and packaging.

 Reprinted in whole

1.85 SHRIMP PEELING PROCESS

Anonymous
Food Engineering 27, 172-173 (November 1955)

A newly patented process (U. S. 2,712,152 1/2, July 5, 1955) subjects shrimp to localized pressure to break connecting membranes. These shrimp are then pinched and vibrated to eject the meat from the heads and shells.

The process employs tiers of sponge-rubber-covered rolls, sprays of water, and a means of separating the meat from the loosened shells. Each section of a tier consists of rolls that are located side-by-side, spaced slightly apart, and mounted on a frame for rotary movement. This frame is vibrated at high frequency by an electric motor.

A second section of rolls in this tier is positioned above and in contact with the rolls of the first section. Each roll shaft has a drive pulley on one end and a reciprocating mechanism on the other end. Power applied to one roll in a section is transmitted to the other rolls in the section by connecting belts. Rolls in the top section rotate in one direction, whereas rolls in the bottom section rotate in the opposite direction.

The shrimp are peeled as follows: shrimp are fed to the first pair of rolls and drawn into the space between them. These rolls loosen the heads and shells from the meat by a combination rotary and reciprocal motion. Small pieces of shell are washed between the bottom rolls. The shrimp then travel through a separator where the larger pieces of shells and trash are thrown into buckets for removal while the shrimp enter a second tier of rolls where the shelling process is repeated.

(over)

 ABSTRACTER: Martin Heerdt

OFFSHORE ALBACORE FISHERY

SARDINE RESEARCH LAB

FREEZING ROCKFISH

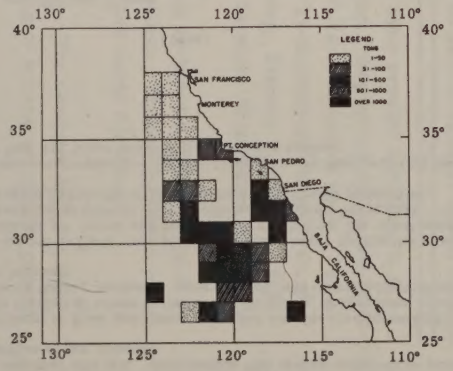
SHRIMP PEELER

1.20

1.85

The number of tiers of rolls and separating stations that are used are no more than are needed to bring about complete peeling and cleaning of the shrimp.

1.10



Catch localities for Pacific albacore during August, 1953, which was first month in which offshore waters yielded noticeably more fish than inshore area.

1.4 (Cross Reference: 3.249)

of the undesirable texture, these fillets received a low acceptability rating. No changes in quality were observed in the fillets after 2 months of storage. After 4 months, the fillets were darker in color, strongly sweet in odor, and moderately tough in texture. The light meat was flat in flavor, and the dark meat was rancid. The samples were judged unacceptable.

On the basis of results with a limited number of fish (12 per species), fillets of blacktip rockfish have a storage life of only 4 to 6 months at 0° F., and fillets of flag rockfish are not suitable for freezing.

1/ Moistureproof, heat sealing, anchored coating, and transparent.

1.5 THE FREE AMINO ACIDS OF FISH. POST MORTEM CHANGES IN STERILE SKELETAL MUSCLE OF NORTH SEA CODLING (GADUS CALLARIAS)

Hodgkiss, W. and Jones, N. R. (Torry Research Station, Food Investigation Organization, Department of Scientific and Industrial Research)
The Biochemical Journal 61, p. iv (September 1955)

Earlier studies showed that the free amino acid composition of fresh codling muscle varies seasonally and that storage of codling in ice leads to changes resulting from the combined actions of leaching, invasion by bacteria, and autolysis.

Bruns (1909) found that flesh of healthy, freshly caught fish is bacteriologically sterile. In an attempt to ascertain the contribution of autolysis to these changes, blocks of muscle have been dissected from freshly killed codling under aseptic conditions and incubated in sterile dishes at 0°.

Muscle, shown to be bacteria-free by subculture into fluid and on to solid media, was homogenized into 75 percent ethanol for chromatographic evaluation as described in a previous communication.

Serial chromatograms showed that, compared with iced fish, little change occurred in most free amino acids. Individuals varied somewhat in the extent of post mortem change but the overall patterns were similar in batches examined at and after the spawning period. Initial compositions varied from batch to batch in the normal seasonal manner. For a typical individual in March, glutamic acid rose from 10 to 20 milligrams/100 grams muscle after 25 days of incubation. β-Alanine and 1-methylhistidine levels rose similarly from 2.5 and 6.2 milligrams to 66 and 101 milligrams/100 grams respectively. Free alanine fell from 16 to 5 milligrams/100 grams. Lysine and leucine similarly decreased from 6.5 and 5.2 milligrams/100 grams to <0.4 milligrams. These changes were

(over)

Reprinted in whole

2.1127 A STUDY OF TROLLING LURES

Milne, B. S.
Western Fisheries 50, 13, 54-55 (September 1955)

Trolling, one of the oldest methods of catching salmon in British Columbia, consists fundamentally of several weighted lines with numerous lures attached being dragged through the water at slow speed. Of the five species of Pacific salmon, only the spring and coho readily strike these moving lures, since they feed more heavily on a fish diet.

From June 29 to August 2, 1953 a study of these salmon was made in the ocean feeding areas off the southwest coast of Vancouver Island. To accomplish this, large and small brass spoons and large and small plastic plugs were used. These lures were selected from the various types commonly used by commercial fishermen. To determine salmon selectivity, four lures of the same type spaced five fathoms apart on each of four separate lines were fished at various depths. A total of 54 coho and 97 spring salmon was caught in this manner. The cohos were taken at depths varying from 5 to 10 fathoms (most at 5) while the springs were taken between 10 and 15 fathoms (most at 15). There was no marked difference in either species in the length of fish caught at different depths.

In the case of the coho salmon the small spoon caught the most, the large spoon caught about four times that of the small plug, and the large plug caught the least. Since all the cohos were maturing in their third year, the range length was limited to 50 and 72 centimeters. For this reason the percentage of the weight or length for this species of salmon was not markedly selected by the different lures. In spring salmon, which varied in both age and maturity (ranging in length from 35 to 92 centimeters), spoons also caught more fish than plugs, but the larger lure was preferred in each type. It is apparent from the differences in the average lengths that the size of fish was selected by the size and type of lure, namely, that the larger lures catch larger fish and that plugs are more selective for size of fish than the spoons. Thus the large spoon caught more and larger fish than the

(over)

ABSTRACTER: Harold C. Johnson

2.11 FISHING BOATS OF THE WORLD

Traung, Jan-Olof (Naval Architect, Fisheries Division, Food and Agriculture Organization, United Nations)
Fishing News, Arthur J. Heighway Publications Ltd., 107 Fleet Street, London, E. C. 4, England, 579 pp. (1955)

I. Boat Types. --
- Short distance fishing
- Surface fishing
- Bottom fishing
- Combination fishing
- Research vessels
- Materials
- Fish holds
- Economics
- Discussion

II. Naval Architecture. --
- Hull shape
- Safety at sea
- Discussion

III. Engineering. --
- Engines
- Propulsion
- Central devices
- Discussion
- Deck gear
- Discussion

IV. Factory Ships. --
- Processing vessels
- Freezer-trawlers
- Notes on factory ships
- Freezing at sea
- Aspects of factory ship operations
- Discussion

(over)

Reprinted in part

2.115 SOME OPINIONS ON THE DESIGN OF SMALL CRAFT AND PARTICULARLY SMALL FISHING BOATS

Chapelle, Howard I.
Maine Coast Fisherman 10, 8-9 (September 1955)

History indicates that the possession of small commercial craft in large numbers is essential to the maintenance of a maritime power. In the construction of fishing vessels, small-craft design is often much different from that of large craft. Economic considerations impose severe restrictions on technical possibilities for design changes and improvements in small fishing craft.

The belief that little science is used in small craft design is supported by the economic restrictions faced by the designer, builder, and owner. Normally, owners cannot afford to pay for expensive sea trials. Small improvements resulting would not compensate for the lost time. The designer's fee is usually not large enough to allow him to pay for the trials, either. This is also true of the builder. Therefore, there is a definite lack of available published data on scientific design of small fishing craft.

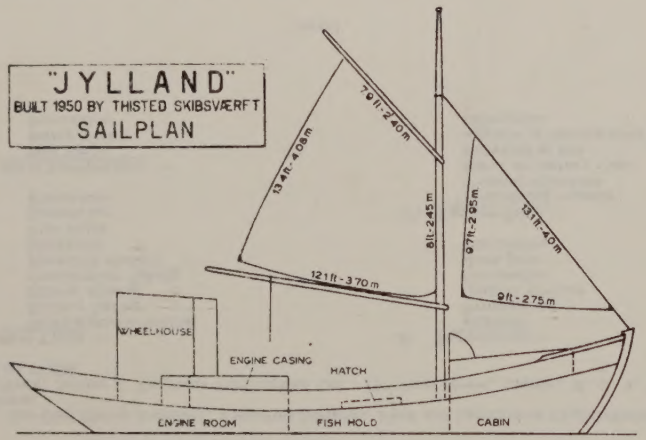
Small craft designers often employ short cuts, such as graphic methods of determination, based on practical experience, interpretation, and approximation. In wooden-hull design, the weight of hull is rarely determined within 5 percent of accuracy.

Half-model designers offer serious competition to graduate naval architects. The half-model whittlers produce some good boats and may be able to produce cheaper small boats than the established naval architect. For larger vessels, detailed plans are superior to the half-model technique.

(over)

ABSTRACTER: Donald E. Powell

2.11 (Cross Reference: 1.01)



2.115

Graduate naval architects are at a disadvantage in attempting to enter the small boat field because their schooling includes only a limited amount on small craft, and less on wood construction. Many young architects cannot draw well, and drafting is essential in small boat designing, since the architect must do this job himself as well as being his own administrator, tax accountant, stenographer, etc.

The question of whether small boat design is more art than science is valid. Something besides academic science is a factor of success in this field, as indicated by the competition given graduate architects by the half-modellers and the draftsmen-designers.

It is important to consider where and by whom the boat is to be built. Common practice in the small boat field is to employ two or more contractors specializing in certain items of construction. This practice is dictated by economics.

A safety factor of about 10 or 12 percent of vessel weight is usually added to obtain the estimated displacement. For hull forms, the design factors are quite different in small craft from those in larger craft of 80 to 100 or more feet. For the required displacement, small draggers are of rather large dimensions. In Canada, the small draggers are especially desired for fishing on foul bottom because they are easier on the gear.

1.5 (Cross Reference: 8.51)

continuous through the 25-day incubation period, but it is likely that the actions of bacterial proteolysis and leaching of salts and protein encountered during normal spoilage in ice would substantially alter muscle enzyme systems. Taurine, glycine, and other amino acids remained constant in level.

Of these values only those of β-alanine and 1-methyl-histidine compare with findings for codling stored in ice. The present study indicates that, with the notable exception of anserinase action and a certain glutamic acid liberation, most changes in spoiling iced codling derive from bacterial and leaching actions. The post mortem changes resulting in uptake of some free amino acids by muscle systems are nevertheless of considerable interest.

2.1127

small spoon, and the large plug caught larger fish than the small plug. The large plug caught the greatest percentage by weight, even though more fish were caught by both sizes of spoons, possibly because the large plugs caught mainly large fish.

Examination of stomach contents revealed that 61 percent of the large spring salmon (over 66 centimeters) contained fish while only 33 percent of the stomachs from the smaller salmon had fish in them. The salmon caught by the large lures were feeding more on fish than were those captured by the smaller lures. Consequently the most striking relationship is that the large plugs caught chiefly large spring salmon that were feeding on a fish diet. Other relationships between size of salmon, lures and food are less obvious, but the small springs appeared to be taken more readily on small lures while feeding on invertebrates or when their stomachs were empty.

Herring, being the dominant food, was contained in half the large spring salmon stomachs but only one-fifth the stomachs of the smaller springs contained herring. Since the herring and the larger plugs were about the same size, vision must play an important role in both feeding and troll fishing. In this connection color of the lure is an important factor which was not tested in this experiment.

It has been shown that trolling lures are selective for both species and size. Although more spring and coho salmon were caught by spoons than plugs, the spoons seem to be more effective in catching cohos. Plugs appear to be more effective than spoons in capturing fish of different sizes. These relationships are probably closely associated with the type and size of food being eaten by the salmon at the time of capture. The trend in recent years to use more large plugs for catching spring salmon off the west coast of Vancouver Island should have the advantage of taking fewer cohos prior to the opening of the season and of protecting more of the small spring salmon. However, the large spoon is still an old favorite and it apparently catches a considerable number of small coho and spring salmon.

1.9 STUDIES ON THE PROTEINS OF THE MEAT OF SEA CUCUMBER (STICHOPUS JAPONICUS SELENKA)

Tanikawa, Eiichi (Faculty of Fisheries, Hokkaido University)
Memoirs of the Faculty of Fisheries Hokkaido University 3, 1 (1955) (In English)

CONTENTS

I. Histological studies on the meat
II. Solubility of the meat proteins in solvents employed for the fractionation of protein mixtures
III. Fractionation of proteins in the meat
IV. Nitrogen distribution and amino acid composition of the fractionated proteins and the whole proteins of the meat part and of the skin part
V. Isoelectric points of the meat proteins
VI. Electrophoretic studies of the fractionated proteins of the meat
VII. Phenomenon of the dissolution of proteins in the meat
VIII. The phenomenon of flow birefringence of the aqueous extract of the meat and the electrophoretical behavior of the water-extracted proteins.
IX. Heat contraction of the meat
X. The amount of collagen in the meat
XI. Dehydration of the meat
XII. Acid coagulation of the meat
XIII. The swelling of the meat
XIV. Hydration of the meat and meat proteins
XV. Hydration of the meat in NaCl solution
XVI. Hydration and swelling of the meat boiled and dried to different moisture contents

(over)

 Reprinted in part

2.116 FISHERIES RADIO NETWORK IN JAPAN

Kimura, K.
Indo-Pacific Fisheries Council-FAO, Proceedings 5th Meeting, Bangkok, Thailand, 177-178 (January 22 - February 5, 1954)

In Japan there are more than 3,000 radio-equipped fishing boats which together with 77 fisheries radio stations on land, distributed throughout the Japanese islands, form a radio network in the promotion of efficient fishing operations. At present 56 frequencies are allocated to the fisheries radio communication system, distributed according to districts and the type of fisheries. Some of the shore stations are owned by the National Fisheries Research Laboratories, many by prefectural fisheries institutions, and a few by private companies.

The largest radio network in Japan covers the skipjack and tuna fishing fields. It has over 1,000 widely distributed boats, and all prefectures facing the Pacific Ocean have one to three land stations. Communication with these fisheries is continuous throughout the day on many frequencies, making it possible to know the conditions of the fishing grounds, and location of schools of fish, as well as the position of each boat and to provide prompt action in event of distress. Other functions include arranging for the landing and marketing of the catch and the preparations required for the next voyage. These messages between fishing boats and stations are of a commercial nature, but there is another government network for the guidance of fishing vessels, namely the prefectural land stations which receive information from their fisheries guidance boats which is then broadcast to the commercial fishing fleet. However, the scale of this network is not large at present.

The only systematic analysis of these functions is carried on by the Tohoku Regional Fisheries Research Laboratory under the Fisheries Agency. The oceanographic environments, circumstances

(over)

 ABSTRACTER: Harold C. Johnson

2.116 PYE MARINE INTRODUCE THE "FISH FINDER"

Anonymous
World Fishing 4, 35 (August 1955)

Recently introduced at Lowestoft, England was the "Fish Finder", a new echo-sounder using radar principles designed solely for the location and detection of fish. The equipment is completely electronic and employs no motors, contacts, or gear boxes. A transmitter pointing downward sends out successive short pulses of supersonic sound waves. These are reflected back by the water, fish, and the sea bottom; and echoes reach the receiver at various intervals of time according to the depth from which they are reflected. These echoes are amplified and displayed on a cathode ray tube, where they appear as horizontal deflections on both sides of a vertical trace. The start of this trace is at the top of the tube and represents zero depth, and the finish of the trace at the bottom of the tube represents the depth to which the equipment is sounding.

The durability of the trace depends on the range of the sounding; the greater the depth, the less durable is the trace because of the greater distance each pulse has to travel from the transmitter, to the depth sounded and then back to the receiver. When the depths sounded are less than 100 fathoms, a steady trace is maintained on the cathode ray tube. A knob on the face of the viewing head controls the depth range. The width of the trace is always in proportion to the depth range setting; the deeper the range, the narrower the trace.

Another knob on the face of the viewing head controls a marker which can be used to select any 7-fathom section of the main trace. This 7-fathom section can then be expanded to the full length of the cathode ray tube to one side of the main trace thus permitting the section to be examined in detail.

(over)

 ABSTRACTER: M. R. Greenwood

2.117 SIR WILLIAM HARDY: DIESEL-ELECTRIC PIONEER

Anonymous
World Fishing 4, 43-47 (August 1955)

The Sir William Hardy is the first diesel-electric trawler to be built in England. Her high-speed-type engines empower a constant-current system driving both the propulsion unit and the trawl winch. She has a soft nose with a whaleback and a cruiser stern. Her particulars are:

Length, o. a. ..... 146 feet	Gross weight..... 418 tons
Beam, moulded... 27 feet, 6 inches	Rated speed..... 11.5 knots
Depth, moulded... 15 feet	Fuel capacity..... 25 days

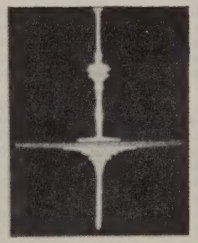
The crew consists of 20 men: skipper, 4 scientists, first officer, 4 engineers, and 10 seamen-fishermen.

Propulsion machinery.--The main power is provided by 4 Meadows-type 6 DMS 970 supercharged diesel engines. Each engine is direct coupled to its own D.C. differential compound-wound Metropolitan-Vickers generator. One to four engines in any combination can be used resulting in a maximum output of 800 b.h.p. Most steaming conditions require only three units - leaving the fourth as a standby. A "Metadyne" circuit protects against overloading, earths, and propeller overspeeding. The main electric propulsion motor, which consists of a pair of Metrovick shunt-wound D.C. motors direct-coupled mechanically on a common shaft, produces a total of 600 b.h.p. with a maximum speed of 200 r.p.m. Ahead/astern changes are a result of a switching operation on the electrical side of the installation. Both winch and screw can be operated simultaneously since the electric trawl winch motors are wired to the main propulsion loop.

 ABSTRACTER: M. R. Greenwood

2.116

Light and filter provisions have been made for using the set day or night. It can be installed as a single complete console unit, or the transmitter/power unit can be installed as far as 15 feet away from the viewing and control head. The transmitting and receiving transducers each require a 10-inch by 5-inch hole in the hull. They are suitable for use in either wooden or steel hulls, and they project very little. Power required is 220 watts AC at 110 or 240 volts.



Excellent example of normal time base echo trace, showing herring near sea bed.

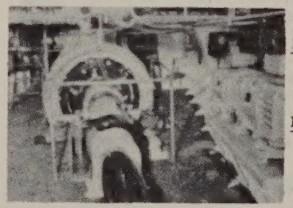
2.117 (Cross Reference: 2.114)

Trawl gear.--The electric trawl winch is driven by two Metrovick motors producing a total of 150 b.h.p. Control is maintained by a field potentiometer at the winch. The motors can pay out against overload and can stand stalled against full load for half an hour. The winch drums have a capacity of 750 fathoms of 2 3/4 inch wire.

Bridge.--The starboard wing of the bridge, fitted with remote controls for speed and steerage regulation, projects to the line of the rail. The wheelhouse is equipped with: rudder indicator, propeller tachometer, s.h.p. motor, engines-in-service indicator, projector compass, gyro compass, hydraulic steering, radar plot, D/F equipment and two echosounders. The radio cabin contains the master gyro compass, navigator equipment, Piometer log, main transmitter and receiver and a broadcast receiver. The bridge is of an aluminum alloy structure.

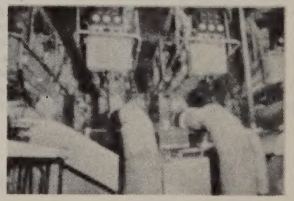
Laboratory.--The laboratory is located immediately behind the winch in the bridge structure. A.C. current is available and improved equipment includes: fume cupboard, comparison microscope on a gimbal table and Calorgas for Bunsen burners.

Fishroom and freezer room.--The fishroom (8-ton capacity) is equipped with removable aluminum alloy partitions and pound floors and is insulated from the ship's skin. The freezer compartment maintains a -20° F. temperature and will be furnished later with two vertical plate freezers.



Left: In the engine room, showing the propulsion motor and shaft turning gear.

Right: View looking forward showing four main propulsion diesel generators.



1.9

XVII. The mucoprotein in the meat
XVIII. General discussion, summary, literature cited

The amount of collagen in the meat of Stichopus japonicus and that of other fish meat (calculated from gelatin-nitrogen)

Samples \ Items	Water content in raw meat (%)	Total nitrogen in raw meat (%)	Gelatine-N in raw meat (%)	Gelatine-N per dried matter (%)	Gelatine-N in Total nitrogen (%)
Stichopus japonicus upper skin layer (A)	88.92	0.88	0.034	0.307	3.86
Dorsal meat	88.25	1.09	0.027	0.230	2.48
Ventral meat (C)	87.00	0.97	0.014	0.108	1.44
Atka mackerel	78.65	2.73	0.046	0.215	1.69
Soi-fish	79.73	2.84	0.028	0.138	0.99
Flat fish	82.66	2.54	0.021	0.121	0.83
Carp	79.21	2.50	0.012	0.063	0.52
Squid	78.14	3.00	0.105	0.422	3.50

The amount of total water, bound water content and the degree of swelling of Stichopus japonicus meat

Samples used	Total water content (%)	gm of water per gm of dried matter (E_{BP})	Degree of swelling (S)	Water content after swelling: Obs. value %	Water content after swelling: Calc. value %	Ratio of swelling (%)
Fresh meat	87.56	1.25				100
Boiled meat	80.86	0.763	0.595			
Immersed meat in H_2O	89.12	0.628	1.05 / 0.97 } 1.01			(100)
Boiled & dried meat	48.30	0.693	1.41	85.11	83.2	34.1
Ditto	43.76	0.561	1.86	79.68	69.8	41.4
Ditto	21.63	0.507	2.67	72.45	90.7	42.7
Ditto	16.02	0.298	3.98	82.17	79.0	59.3

2.116

of the fishing grounds and other valuable information along the northeastern sea area of the Japanese Pacific coast are sent via the Ishinomaki fisheries radio station, and during peak skipjack and albacore fishing around Izu peninsula, similar information is sent to this area via the Yaizu fisheries radio station. One of the major functions of the Tohoku Laboratory is the research of skipjack fisheries throughout the entire Pacific waters.

The main work of this fisheries guidance system is to broadcast the synoptic isothermal chart. This is made up from data received daily from many fishing boats and whalers operating in these waters, together with oceanographic data sent from fisheries guidance boats of each prefecture and the marine observation vessels of the various Japanese agencies. Assembled, the results are then broadcast and are interpreted by the fishing vessels which make up their own isothermal charts on board so that they may study and investigate the daily oceanographic environmental conditions.

The Tohoku Regional Fisheries Research Laboratory also trains fishermen to plot and interpret the isothermal chart. The fishermen have shown great interest in this study.

2.117 DEVELOPMENT OF PACIFIC TUNA CLIPPER DESIGN

Petrich, James F.
National Fisherman 36, 14-15, 40 (September 1955)

The modern tuna clipper, probably the most complex fishing boat, was developed around one of the simplest and most direct ways of catching fish -- luring them with live bait and catching them individually with hook and line, for this remains one of the most effective ways of catching tuna and is a primary consideration around which revolves the whole design of the craft. Hence the stern is built low in the water, the main deck aft being practically awash at all times, and around which are hung the fishing racks designed so that the fisherman can brace himself against the impact of the tuna striking the hook and have enough leverage to lift the heavy fish over his shoulder and into the boat.

The vessel, 90 to 169 feet in length, is trim and stable with a yacht-like appearance. Constructed of either wood or steel, it has a raised deck forward reaching back well past midships to the canopied deck boxes built on the main deck aft. Midships is the single mast and boom, forward of which is the deckhouse with comfortable accommodations for 10 to 20 men. Above is the pilothouse and chart room; behind them, the stack. Below decks and well forward is the main engine room with the main diesel propulsion engine, diesel-driven generating sets, two large bait-water pumps and a maze of other pumps, machinery, and equipment. From the engine room aft is the full-height shaft alley flanked on either side by 8 to 16 watertight wells used to carry diesel fuel oil and live bait outbound and refrigerated tuna on the homeward voyage. Above the engine room in the 'tween deck space is the upper engine room, the main switchboard, refrigeration, and air compressors, CO_2 firefighting apparatus, various equipment and machinery, plus the engineer's workbench. Forward of this room is storage, while aft is the spacious galley cabin where the passageways on each side contain hatches to the wells below deck.

(over)

 ABSTRACTER: Harold C. Johnson

2.12 GULF OF MAINE BLUEFIN-TUNA EXPLORATION - 1954

Murray, J. J. (Exploratory Fishing and Gear Development Section, U. S. Fish and Wildlife Service, East Boston, Massachusetts)
Commercial Fisheries Review 17, 17-21 (June 1955)

Exploratory fishing for bluefin tuna (Thunnus thynnus) in the Gulf of Maine and adjacent waters has been conducted since 1951 by the Exploratory Fishing and Gear Development Secion of the U. S. Fish and Wildlife Service. Major objective of the program has been to evaluate the potentiality of this resource and determine the possibility of developing a commercial tuna fishery and canning industry in the region. The tuna purse seiner M/V Western Explorer, chartered for the initial work during 1951, completed 8 trips with a total catch of 90 tons of tuna. Operations were continued in 1952 and 1953 using Japanese-style tuna longline gear as the principal fishing method. Although this method proved less productive, valuable information relative to conditions affecting the general availability of tuna was gathered

In a continued effort to promote commercial development of this fishery, a cooperative agreement was made with the owners of the California tuna purse seiner M/V Western Pride for the season of 1954. Tuna fishing equipment of the Service, consisting of a standard Pacific Coast-type tuna purse-seine, a seine skiff equipped with a 100-hp. engine, and accessory gear was made available to the vessel operators, who in return supplied the fully equipped and manned purse seiner and were responsible for all operating costs.

Fishing activities were conducted from July 28 to September 9, 1954, in the Cape Cod-South Channel area between 41° 38' - 42° 08' north latitude and 68° 30' - 70° 00' west longitude. A total of 10 purse-seine sets was completed with a total catch of 48 tons of bluefin tuna averaging between 30 and 40 pounds a fish. Best fishing occurred on August 21 and 22 when 4 sets in the South Channel netted 32 tons of fish. Tuna schools were sighted on 13 of the 26 days spent at sea. Sizes of schools observed

(over)

 ABSTRACTER: Harold C. Johnson

2.15 REEFER TANKS KEEP FISH FRESH, CUT WEIGHT LOSS

Bloomberg, Ray
Food Engineering 27, 111, 159 (September 1955)

Salmon canners are using refrigerated sea water to keep fish fresh and avoid weight loss before canning. Two salmon canning companies have equipped barges with refrigerated sea-water holding tanks. One company has equipped a 74-foot steel vessel with holding tanks, and two other companies have installed shore tanks.

The tanks are 7 x 14 x 16 feet in size and will hold about 70,000 pounds of fish in refrigerated sea water. Each is equipped with two "chimneys" through which the fish are loaded and a sluice gate through which the fish are unloaded. The chimneys also relieve or prevent side pressure due to wave motion in the full tank when the barges are at sea. Two inches of insulation has been applied to the sides and bottoms of these tanks as an aid in holding the water at 30° F.

To place the holding tanks into operation, each tank is pumped full of clean sea water. This water is then chilled from 55° F. to 30° F. by circulating it through a serpentine brine raceway chiller with a pump at the rate of 850 gallons per minute. About 12 hours are required to lower the temperature of the water to 30° F. Recirculation through the cooler about 6 times an hour will maintain the water at 30° F. For loading, each of the tanks is equipped with a fish elevator that lifts the fish from the floor of the barge to a chute at the top of the tank that guides the fish into the loading "chimney". Salmon that are at 70° F. can be chilled to 30° F. in 30 hours. In the interim fish quality is protected by the cold sea water.

(over)

 ABSTRACTER: Martin Heerdt

2.9 ROLE OF HISTAMINE IN POISONING WITH SPOILED FISH

Geiger, E. (University of Southern California Medical School)
Science 121, 865-866 (June 17, 1955)

It has been generally assumed that during "spoilage" of fish bacterial toxins accummulate in the otherwise edible fish meat and that the pathological symptoms observed after consumption of spoiled unprocessed or canned fish are produced by the action of bacterial toxins. Since 1946, however, three papers have been published in which it was suggested that in cases observed in Indonesia, France, and the Philippines, histamine was responsible for poisoning after consumption of spoiled fish. This article reports experiments performed to investigate the role of histamine in fish spoilage. About 14 years ago, we found that the skin irritation observed after handling of spoiled fish is similar to that produced by histamine. Following this lead, we established that the concentration of histamine, which is present only in traces in fresh sardines, mackerel, tuna, and salmon, increases rapidly during spoilage up to values of 120 milligrams/100 grams fresh meat within 24 hours.

We investigated the mechanism of histamine formation during spoilage and found that no histamine is produced during aseptic autolysis of fish; we also found that histamine is a product of bacterial decarboxylation. This point, however, will require further investigation, for I have found that in contradistinction to the round fishes, such as tuna, salmon, mackerel, and sardine, only small amounts of histamine are produced during spoilage of flat fish, such as sole and halibut. The total histidine content of all these various fish proteins seems to be identical, and therefore structural differences of the proteins may be responsible for the difference in the amounts of histamine produced during spoilage. Because of such structural differences, the histidine present in round-fish protein seems to be more susceptible to bacterial action. These investigations, which indicate that considerable amounts of histamine are produced during spoilage of round fish, seem to support the assumption

 Reprinted in part

TUNA CLIPPER DESIGN

BLUEFIN TUNA EXPLORATION

CHILLED SEA WATER HOLDING SYSTEM

HISTAMINE POISONING IN SPOILED FISH

2.12 (Cross Reference: 1.10)

were estimated from 2 to 200 tons with the majority of schools in the 10- to 20-ton class. It was conservatively estimated that over 1,000 tons of tuna were sighted.

Weather conditions were generally favorable for purse-seining until the hurricane on August 31. Surface water temperatures recorded during August in the vicinity of the fishing grounds ranged from 59° to 65° F. After the hurricane a sharp drop in water surface temperature was noted and no large schools of tuna were found in the previously productive area.

Record of Purse-Seine Sets and Bluefin Tuna Catch of M/V Western Pride, 1954

Date	Position of Set	Est. Size of School	Catch	Surface Temp.(F)	Remarks
		. . . (In Tons) . . .			
8-7	15 Miles Southeast Nauset Light, Cape Cod	5	-	63	Fish sounded out of seine during pursing operation.
8-9	40 Miles East Southeast Chatham Light, Cape Cod	15	-	64	School not encircled due to fouling of cork line during set.
8-10	45 Miles East Southeast Chatham Light, Cape Cod	80	3	65	School surrounded and pursing completed when heavy seas ripped net and caused loss of fish.
8-21	50 Miles Southeast Cape Cod Light, Cape Cod	2	2	65	Perfect set captured small school.
8-21	50 Miles Southeast Cape Cod Light, Cape Cod	15	-	65	Missed school.
8-22	55 Miles Southeast Cape Cod Light, Cape Cod	10	10	65	Perfect set.
8-22	55 Miles Southeast Cape Cod Light, Cape Cod	20	20	65	Perfect set.
8-25	5 Miles Northeast Cape Cod Light, Cape Cod	6	1.5	63	Main body of school sounded before pursing completed.
8-25	5 Miles Northeast Cape Cod Light, Cape Cod	11	11	63	Perfect set.
9-7	40 Miles East Southeast Chatham Light, Cape Cod	2	0.5	59	Small school wild and erratic, main body of school escaped.

2.9

that histamine is the toxic ingredient in fish poisoning. However, the authors who propose this theory do not discuss earlier investigations according to which oral or enteral administration of large amounts of histamine did not prove to be toxic, probably because histamine is detoxified during its passage through the intestinal wall.

We investigated this problem further by using guinea pigs, animals that are particularly sensitive to histamine. We found that 100 milligrams/kg. (body weight) of histamine base dissolved in 5 milliliters of water and neutralized with HCl to pH 7.5 does not kill the guinea pig when it is given by stomach tube. However, when the intestinal mucosa was damaged beforehand by administration of saponin for 2 consecutive days, the same dose of histamine killed six of ten animals within 60 to 100 minutes. In these experiments we found that when the histamine solution was spilled in the mouth, severe symptoms and even lethal shock followed. This observation confirms the reports of earlier authors who found that histamine produces shock when it is absorbed from the oral mucosa, the tongue, or the trachea.

In other experiments we incubated fresh tuna meat after inoculation with a histamine-producing strain of marine bacteria for 56 hours at 37° C. The samples contained, at the end of incubation, 190 to 210 milligrams of histamine per 100 grams of fresh substance. This spoiled fish meat was fed to dogs, cats, rats, and mice. Guinea pigs do not spontaneously consume fish tissue. Therefore, they received, by stomach tube, 10 milliliters of a concentrated aqueous extract containing 80 to 100 milligrams of histamine made from spoiled fish. No symptoms of poisoning could be observed in these experiments, and all animals survived. These experiments do not support the contention that histamine present in spoiled fish is the cause of fish poisoning. Instead, they indicate that other toxins produced by certain toxin-forming microorganisms in the course of spoilage may be mainly responsible for toxic symptoms.

2.117

Keeping huge quantities of live bait is a very important factor in the success of a modern clipper and has imposed special requirements in its design. Bait wells and boxes with white painted interiors are also fitted with watertight glass lenses in the top and sides through which electric lamps shine, lighting the interior and helping to prevent the bait from becoming frightened. Bait pumps with a capacity enabling a complete change of water every 12 minutes (with spares in event of breakdown) discharge into a common header pipe which feeds through individual valves into the bottom of each bait well and box. Rising to the top, the water passes through a screen, then is piped overboard.

As fishing grounds became more distant the high seas clipper was fashioned for prolonged trips ranging from 10,000 to 12,000 miles; however, preserving the catch from the time the first tuna is caught and until the boat is loaded and the fish is discharged at the cannery creates a great refrigeration problem. It was found that the large cumbersome brine cooler could be eliminated and the refrigeration of the fish accomplished by means of just the ammonia coils being spaced 6 to 8 inches apart to line the inside of the tanks. These coils draw heat from the fish and circulate brine by means of direct expansion of the ammonia in them. This ammonia is supplied directly from a large ammonia receiver through automatic expansion valves at each well. The ammonia gas is drawn from the coils in any of three suction headers maintained at three different pressures by back pressure valves corresponding to the temperatures required to, (1) chill sea water for initial tuna chilling, (2) freeze tuna in heavy brine from 20° to 25° F., and, to (3) maintain tuna "dry frozen" at about 10° F. Vessel capacities range from 130 to 630 tons of frozen tuna.

2.15 (Cross Reference: 3.30)

One of the canning companies estimates that refrigerated sea water will conserve an amount of salmon equal to one-half fish per case of canned product or 62 cents per case. These barges are towed to the fishing grounds to take on salmon from the fishing boats; consequently they permit operations in areas that are removed from the cannery. Unlike the unrefrigerated salmon boats, the barges can remain in fishing waters a much longer time without harm to fish quality. When installed ashore, refrigerated tanks provide a reservoir of fish with which canneries may even-out production. Overtime operation is eliminated, since the fish may safely be held from one day to the next.

2.3 WHAT FDA LOOKS FOR IN MAKING A PLANT SANITATION INSPECTION. PART II.

Holmes, Edward L. (American Sanitation Institute, St. Louis, Missouri)
The Canner 120, 24-26 (June 13, 1955)

Where evidence of insect infestation are found every effort is made to find the route of contamination to the finished product, as well as to find actual insect debris in the investigational samples of the finished product. Such information has important bearing on regulatory action against firms or products involved.

Canners' Responsibilities

1. Cannery management must now by law permit inspections.
2. Cannery management has the right to request that inspections be made only in the presence of a duly authorized representative of the firm.
3. The new amendment to the law specifies that inspections be carried out in a reasonable manner.
4. A reasonable manner includes the taking of photographs. Prohibition of the taking of photographs would be viewed unfavorably in court proceedings.
5. Whenever investigational samples are taken by FDA, management should take a duplicate set for analysis; this will give them advance notice of what to expect.

Information to be Gained From FDA Inspection

1. Field inspectors have been instructed to avoid replying to questions that might occasion debate or argument. For example, an inspector does not have the authority to provide a manufacturer with a critical review of labeling. Labeling standards are handled in Washington, D. C. at an officer level, and occasionally by a district office.

(over)

COMMERCIAL FISHERIES ABSTRACTS VOL. IX NO. 3 PAGE 9
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE. ABSTRACTER: Max Patashnik

3.230 NORWEGIANS FREEZE MACKEREL FILLETS IN ALGINATE JELLY

Anonymous
Fishery Products Report S-140, page 1, (July 20, 1955)

Full-scale production of deep-frozen mackerel fillets in alginate jelly has been started by Norges Makrellag, the cooperative marketing organization of Norwegian mackerel fishermen, reports a June 16 bulletin from the Norwegian Information Service.

Thoroughly tested in pilot operations, the method consists of deep-freezing the whole or filleted fish in alginate jelly.

Even after long storage the alginate-frozen product retains the freshness and flavor of fresh fish. This year Norges Makrellag plans to deep-freeze about 1,000 metric tons of mackerel fillets. As soon as more machinery is available the output will be substantially increased.

The fishermen's cooperative, which had previously been deep-freezing whole mackerel, started trial freezing of fillets in alginate jelly last year. These experiments proved so successful that full-scale production has been launched in Kristiansand, Arendal, and Stavanger. Later, additional plants will be opened in Haugesund and Egersund. The Kristiansand filleting plant uses some 45,000 pounds of raw mackerel a day. A substantial part of the production has been sold abroad.

COMMERCIAL FISHERIES ABSTRACTS VOL. IX NO. 3 PAGE 9
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE. Reprinted in whole

2.6 MARKET TESTING -- THE STOP AND GO FOR NEW FROZEN PRODUCTS

Anonymous
Quick Frozen Foods 18, 39-41 (December 1955)

Pre-testing the consumer reaction on a new frozen food product can cut losses. Progressive packers know this fact and work constantly to improve methods and accuracy of market testing.

First, obvious defects, such as off-flavors can be eliminated by the immediate staff sampling the product. Second, obtain consumer reaction based on a sales test.

To set up a sales test, select a test area on a limited basis and work through a distributor. Back your product with introductory promotion. One to three months is needed to establish sales potential. Determine what percentage of sales is based on novelty and introductory push. Decide how much repeat business you can count on. Figure season of the year and economic status of clientele. Evaluate any special factors which may have affected sales, i.e., competition.

There are business groups that specialize in obtaining market testing information on the consumer level. Large newspapers have merchandising and promotion staffs to assist the packer who plans to back his testing with newspaper advertising.

For the small company, suggestions for low cost market testing are, (1) obtain test reaction by serving samples at a convention booth or to similar groups, (2) plan on in-store demonstration, and (3) use tie-in sales, i.e., offer special price for new item. To avoid heavy investment, use stock labels with trade name on the lid. Wait for acceptance before designing own label.

(over)

COMMERCIAL FISHERIES ABSTRACTS VOL. IX NO. 3 PAGE 9
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE. ABSTRACTER: Thelma Rose

3.231 APPLICATION OF AUTOMATION TO FROZEN FOODS

Cronkhite, L. W. (Atomic Instrument Company, Cambridge, Massachusetts)
Frosted Food Field 21, 24-25 (July 1955)

Nature of the Problem

The term automation refers to the increased mechanization of industrial methods as developed over a period of many years, and now accelerated by electronic and other counting devices. It represents the transition from "brute force" to precise mechanical control characterized by rapid and constant performance. Since the equipment is so elaborate and detailed in design the services of specialists not usually available from industrial plant staffs are required. Several fundamental principles are involved.

Reconceiving the Process

Changing a process line from human control to electronic instrumentation may involve more than merely adding a few vacuum tubes and their accessories. The electronic solution should not be unduly complicated. The apparatus design should be well above assumed tolerances. Great care should be exercised in choosing the type and number of electronic units needed. Independent process and plant flow experts now available may need to be employed, or at least consulted, especially by smaller organizations.

Revamping the Operation

Introducing electronic counting controls usually involves mechanical modifications of feed lines which handle such items as cans, packages, pills, and liquid flows. The specific system chosen should aim at low installation cost, economy of operation, and a short "down time" period for conversion to the new program. This requires technical personnel with a high level of basic engineering

(over)

COMMERCIAL FISHERIES ABSTRACTS VOL. IX NO. 3 PAGE 9
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE ABSTRACTER: Claude E. Thurston

2.6 (Cross Reference: 3.26)

Market tests are valuable in reevaluating old products. Often information is uncovered which makes it possible to change and rejuvenate an item that is in a sales rut.

A valuable byproduct of good comprehensive market testing is found when consumers tell why they like or dislike a product. Delving into such reasons is called "motivation research" by professional research houses and functions as an idea source for new marketing action.

Market testing can save packers from blunders of merchandising which could prove financially distressing. As a form of promotion, it gains good will with both retailers and consumers. Properly used, the results can be profitably used in promotion and advertising.

Market testing of new products can bring ideas for new products and new ways to present them, as well as data on the product being tested.

3.231

training in electrical, electronic, and related techniques.

Choice of Available Devices

The vacuum tube, as an electronic valve, is highly variable in performance and durability ranging anywhere from 5,000 to 50,000 hours. More recently developed "solid state" germanium transistors, silicon diodes, and magnetic cores are competing with the vacuum tube both in efficiency and durability. Low-current, low-heat, cold cathode tubes are now available which are self-contained counting devices and are thus admirably adapted to plant-control programs.

Specific Examples Cited

One plant employed pre-settable banks of cold cathode glow counter tubes to reduce a liquid stream to countable discreet units and thus measure off given volumes which were individually directed to other parts of the process. A more intricate problem involved the instantaneous calculation of speeds, multiple strains, or similar fast measurements and collaterally producing instantaneously printed results in "real time" at the moment of occurrence.

Applications to Counting

In addition to the well known procedures for counting caps, pills, cans, and other discreet units, newer applications now include velocities, pressures, temperatures, flow rates, viscosities, gages, lineal measurements, sheet counting, batching, and similar recording of speeds too great for mechanical counters. In most cases the machine operation can be made fully automatic by the use of simple timing elements.

Present Trends

Production plants are quite generally turning to the wonders of electronics. When the new art is seasoned with skill, applied with wisdom, and proven in economy the race to full automation will develop in earnest.

2.3

2. Field inspectors are obliged to report to the cannery in writing any objectionable condition, (adulteration, unsanitary conditions, etc.) and to elaborate upon them verbally.

FDA Action

If after an inspection there is sufficient evidence to indicate a violation, the government may issue a citation which in effect consists of a notice to appear at a hearing to show cause why the canner should not be prosecuted. This may take place without a preliminary seizure or after a seizure has been made. Under these circumstances the canners' interests would be best protected by securing the assistance of a professional sanitarian consultant.

FDA as Advisor

The food processor cannot rely upon the FDA to advise and protect him against the development of unsanitary conditions. All canners must assume the responsibility for the maintenance of an adequate sanitation program coupled with a system of periodic sanitary self appraisals.

3.230

3.235 SPECIALTY SEAFOOD ITEMS -- NOW PRE-COOKED, FROZEN, AND READY FOR HEATING

Gale, Arthur (Paper Cup and Container Institute, Inc.)
Fishing Gazette 72, 40 (October 1955)

New Products Available

Specialty seafood items that are pre-cooked, frozen, and ready for heating have become more widely available. Dishes that were formerly impractical for the homemaker to prepare because of the variety of fish and shellfish ingredients are now frozen and sold by restaurants. Other preparations that once were limited to areas with fresh fish and shellfish available can now be frozen for home, restaurant, and institutional use. The two following examples of these techniques are each typical in its field.

Restaurant Produces Bouillabaisse

Louis Morino, proprietor of a famous restaurant opposite Fulton Fish Market, has started freezing his famous bouillabaisse. Mr. Morino packages what is left at the end of the day in round paper containers for take-home sale. This side line has become so popular that a much larger daily supply must be made. Thus what was formerly waste (bouillabaisse cannot be kept) is now a profitable product and worth a great deal in advertising alone.

Packaging Firm Produces Clam Chowder

Mrs. W. F. Morgan manages a much larger seafood packaging business which was based on her very successful recipe for clam chowder. This firm manufactures and packages 3,000 gallons of concentrated clam chowder during the season. Clam and fish chowders are available in round, nested paper tubs in institutional and retail sizes.

(over)

ABSTRACTER: Lois Elgin

3.238 CHAIN TESTS FROZEN, WAXED MEAT CUTS: TRADE SCANS MOVE

Anonymous
Frosted Food Field 31, 8, 9 (October 1955)

Prepackaged frozen meats may be the next revolutionary step in food marketing. An Ohio food chain that operates 35 retail outlets and services 32 franchised stores has been selling waxed, frozen meats in recent months.

By this process, cuts of frozen meat are dipped into a bath of liquid plastic wax, shipped to retail stores and sold out of refrigerated cases.

A spokesman for the food chain reports that the adoption of this process has enabled them to reduce prices on meat cuts by 15 percent. The price reduction is a result of decreased packaging costs, lower meat handling costs, centralized prepackaging, and labor saving at every stage of the marketing process.

The major disadvantage of the process is that the housewife cannot see the meat product she is buying as the wax is not clear. In an effort to overcome this disadvantage only U.S. grades "choice" and "good" meat is being used and a money-back guarantee is given to the customer. So far no meat had been returned.

The food chain is planning to use the wax process on seafood and poultry items as well as meat.

The wax can be easily peeled from the meat after thawing or after 5 minutes in cold water. The wax comes off easily without clinging to the meat.

ABSTRACTER: Kathryn L. Osterhaug

3.249 EFFECT OF FLUCTUATING TEMPERATURES ON FROZEN TURKEYS

Klose, A. A.; Pool, M. F.; and Lineweaver, Hans
Food Technology 9, 376 (August 1955)

Quality deterioration in ready-to-cook Broad Breasted Bronze turkeys was studied over a period of 18 months as a function of temperature, temperature fluctuation, packaging, and scalding temperature. Experimental temperature conditions included constant temperatures of -30° F., -10° F., 0° F. and +10° F., and a temperature that fluctuated from -10° to +10° to -10° F. in a 24-hour sine wave cycle.

Moisture loss from a relatively permeable package increased in expected fashion with increase in temperature, while loss for the fluctuating-temperature condition exceeded that for the corresponding mean temperature (0° F.) and by rough interpolation equaled the loss for about a constant +3° F. condition. In relatively impermeable packages, appreciable amounts of moisture were lost by the bird and deposited as frost inside of the package. Frost formation increased with temperature, and for the -10 to +10° F. fluctuation was considerably greater than for the highest (+10° F.) constant temperature. Turkeys scalded at 140° F. developed almost twice as much frost as birds scalded at 126° F.

Deterioration in appearance associated with the dehydration of the skin layer, while principally influenced by the relative permeability of the package, increased appreciably with each stepwise increase in storage temperature. Appearance of the turkeys held at the -10° F. to +10° F. fluctuation did not differ significantly from that of birds held at 0° F. Similarly, rancidity development in the raw fat, and accompanying off flavors in the cooked fat and meat, were about the same for the fluctuating temperature condition as they were for the mean (0° F.) temperature.

(over)

Author's summary

3.30 RUSSIA DEVELOPS HER FISH INDUSTRIES

Anonymous
Food Manufacture 30, 419 (October 1955)

The Soviet Union has developed her marine and inland fishing industries on a large scale in recent years. The Soviets best known products on the world markets are canned crab, canned salmon, and caviar.

Crab. --Canned crab is prepared from the giant crabs that are caught along the sea coasts of Kamschatka and canned on floating factory ships. Illustrated descriptions of these ships recently appeared in the March 1955 issue of the Soviet foreign trade journal Vnesh. Torgovaya. The two best known brands of canned crab are Chatka (Fensi) and AKO or A. The Soviet crab-canning industry claims to use the best canning practices available for packing and processing crab including the use of enameled cans with parchment liners. Crab meat is packed in cans having a capacity of 198 grams or 7 ounces net dry weight. These cans are sold in fiberboard cases of 5 dozen tins or wooden cases of 4 or 8 dozen tins.

Salmon. --Canned salmon is prepared from four species of salmon found in the Pacific Ocean, bordering on the eastern shores of the Soviet Union and in the coastal waters and rivers of the eastern shores during the spawning season. These four species of salmon are as follows: red, silver, pink or humped, and chum. They are canned without flavoring of any kind except salt. The canning season corresponds with the season of spawning migration and lasts only a few weeks or even days in a year. The canneries are mechanized and use devices such as automatic scales. The best known brand of canned salmon is Sokra brand. Salmon is packed in 227-gram or 453-gram net capacity cans. The minimum weight of salmon in these two sizes of cans must be not less than 220 grams and 440 grams,

(over)

ABSTRACTER: Martin Heerdt

FROZEN FISH DISHES

FROZEN WAXED MEAT

EFFECT OF -10° to +10° F. STORAGE

RUSSIAN CANNED SEAFOOD

3.238 (Cross Reference: 3.26)

3.30 (Cross Reference: 3.5)

respectively. The 453-gram-capacity can comes in either a tall or a flat style for use in packing small or large salmon, respectively. The small cans are sold 5 or 8 dozen in fiberboard cases, and the large cans are sold 3 dozen in fiberboard cases. The large cans also are sold 4 dozen in wooden cases.

Caviar.--Russian caviar is well known. The center of the caviar industry is also one of the world's richest fishing grounds. This center is located at the delta of the Volga river and the shallow waters of the Northern Caspian Sea into which the Ural, Kura, and Terek rivers flow. The caviar or roe (eggs) of the sturgeon (especially the sturgeon Acipenser güldenstadtii) has been prized for many years as a delicacy. Caviar is based mainly on three different kinds of sturgeon, namely, osetr, beluga, and sevryuga. Granular caviar is of a dry friable consistency such that each grain or egg is easily separated from the others. The color of caviar ranges from light red to very dark grey or nearly black and contains from 3-to 5-percent salt. Some caviar may contain up to 10-percent salt. Granular caviar is sold in small oak barrels or 50-liter tubs.

Pressed caviar differs from granular caviar in that it has a more compact and soft consistency and is packed in oak tubs of 20-, 30-, and 50-liter capacity. Connoisseurs reportedly prefer the pressed form.

Caviar in larger containers must be held at -2° or -3° C. during storage and in transit to prevent spoilage. A pasteurized form of caviar is available in glass jars of 28-, 56-, or 112-gram capacity. These jars which are hermetically sealed in vacuum closing machines, have achieved wide popularity at home and abroad. A granular caviar made from salmon roe and especially the roe of Oncorhynchus keta has found equal acceptance with other kinds of caviar. Russian caviar is also made for export from the roe of freshwater fish such as pike, carp, roach, and bream.

3.235

After experimentation, Mrs. Morgan has found that the best method is to cook the fresh vegetables, adding the clams and heating them through at the last minute. No thickening is used in this thick clam chowder; milk or cream is added before serving. Recipes are spot-checked, as the products must be flavorful in large or small quantities. Large scale equipment is used in the manufacturing process. For freezing and storage facilities Mrs. Morgan uses a cold storage company in an adjoining building. The packaged chowder is carried there by conveyor belt. Mrs. Morgan's thriving clam chowder business has opened a new market for seafood products. She recently began packaging fish chowder and Manhattan chowder, and presently is experimenting with clam bisque.

3.249

The results indicate that, under normal commercial conditions of frozen storage (moisture impermeable package and temperature range of -10° F. to +10° F.), the only factor for which a periodic temperature fluctuation is inferior to the mean temperature is the accumulation of frost in the package, and this influences appearance but not eating quality.

3.30 REPORT ON DECOMPOSITION IN SHELLFISH

Barry, Helen C. (Food and Drug Administration, Department of Health, Education, and Welfare, New Orleans, Louisiana)
Journal of the Association of Official Agricultural Chemists 38, 670 (August 15, 1955)

Recent studies on decomposition in shellfish in this laboratory have been confined to the organoleptic and chemical analyses of canned wet pack shrimp. Both putrefactive and ammoniacal types of protein decomposition have been found in raw shrimp. In the canned product both types can be distinguished by analysts trained in organoleptic testing.

Indole has become a recognized chemical index for the putrefactive type of decomposition. No chemical index has been established as a criterion of the ammoniacal type. Fieger and Friloux in their studies on fresh and iced shrimp found trimethylamine nitrogen, volatile acids, and amino nitrogen to be of value in indicating whether spoilage had occurred. Their taste panel experiments are reported in terms of palatability and flavor. Experimental work in this laboratory has been directed toward finding a chemical index for organoleptically detectable decomposition of both putrefactive and ammoniacal types together or the ammoniacal type alone in canned shrimp.

Volatile bases, volatile reducing substances, succinic acid, and pyruvic acid were found to increase with decomposition but not to the degree necessary for a criterion. Studies on the breakdown products of the basic amino acids seem more promising and will be continued.

 Reprinted in whole

3.33 REDUCTION OF CURD IN CANNED SALMON PREPARED FROM FROZEN FISH, PART I -- USE OF TARTARIC ACID AND SODIUM CHLORIDE BRINE DIPS

Dassow, John A. and Craven, Howard J.
Commercial Fisheries Review 17, pp. 1-5 (August 1955)

Large amounts of proteinaceous curd frequently form on the surface of the canned product prepared from frozen salmon. The white curd was most noticeable on the highly colored red salmon (Oncorhynchus nerka). These tests determined the extent of curd reduction by the use of (1) tartaric-acid dips and (2) brine dips for pretreatment of thawed salmon steaks prior to canning.

Samples.--Red salmon (Oncorhynchus nerka) and coho salmon (Oncorhynchus kisutch) were obtained from a local cannery approximately 18 hours after the fish were removed from a trap. The fish were frozen in the round at -20° F. in air, glazed heavily, and stored at 0° F. in a laboratory cold storage. After the red salmon had been stored 14 weeks and the coho salmon had been stored 28 weeks, the fish were thawed in air overnight, dressed, and then cut into can-height steaks for tests on prevention of curd formation by use of tartaric acid dips and of brine dips. Dip times of 1/4, 1/2, 1, and 2 minutes in 5-percent, and 1 minute in 2-percent tartaric acid were used. Dipped steaks were drained free of excess solution before canning. For brine tests, dips of 10 minutes in 70-percent saturated brine and 1/4, 1/2, 1, and 2 minutes in saturated brine were used. Test and control samples were packed in 1/2-pound C-enamel cans, and 1/8-ounce of dry salt was added to all samples except those in which the salmon steaks were dipped 2 or 10 minutes in brine. Cans were vacuum-seamed, processed 85 minutes at 242° F., cooled in air, and stored at room temperature for 3 to 4 weeks before examination.

(over)

 ABSTRACTER: John A. Dassow

3.4 WHERE THERE'S SMOKE

Anonymous
Gourmet 14, 9, 14 (September 1954)

Smoked foods are enjoying a revival of popularity in America. The ancient art of smoking was devised to preserve food, but modern smoking is more concerned with flavor than preservation. However, all lightly smoked foods need to be refrigerated as ordinary foods are. It is not difficult to build small smoking units.

The barrel smokehouse is easy to construct and gives satisfactory results. A wooden barrel, which has had the ends knocked out, is placed over a hole in the ground about 2 feet deep. Wooden strips, from which the food will hang, are nailed inside the barrel on two sides a few inches below the barrel's top. A fire should be built about 12 feet from the barrel in a pit about 2 feet deep on the side of the barrel from which prevailing winds usually come. The fire pit and the smokehouse are connected by a covered trench or by a train of terra cotta drainpipe. Both the top of the barrel and the pit should be fitted with covers; the cover of the pit acts as a draft when partly raised.

A shed smokehouse is the answer if a more permanent installation is desired. A smokehouse pit and a fire pit are dug just as in the case of a barrel smokehouse. The pits should be lined with brick. The specifications for the shed to be placed over the smokehouse pit are as follows: The inside measurements of the small shed are 7 feet high and 4 feet square. A false bottom with 3/4- or 1-inch auger holes bored in it at 2-inch intervals is placed on the bottom of the shed. On the two opposite interior sides of the shed wooden battens at 1-foot intervals are nailed, the first about 18 inches below the top. There should be four of these battens or strips on either side of the shed; the ends of the sticks on which food will be smoked will rest on them. Sticks will do for most items, but oven-type

(over)

 ABSTRACTER: Lois Elgin

3.4 AUTOMATIC SMOKEHOUSE PERMITS SMOKING OF SALMON THE YEAR AROUND

Dissen, Irwin (Chicago Smoked Fish Company) (Reported by Food Processing Staff)
Food Processing 16, 32 (September 1955)

Salmon prepared as Lox requires comparatively low drying temperatures, between 112° F. and 117° F. Too high a temperature dries the surface faster than the interior and will result in a slower drying rate with shrinkage, loss of fat, and an undesirable product. A Chicago company has solved the problem with a new, automatically controlled air conditioner and smokehouse.

Salted sides are first freshened in moving cold fresh water for 38 hours. Sides are then fastened to "combs" which are hung on the smoke tree to drain and then placed in the smokehouse which holds 600 10 1/2-pound sides. The entire drying and smoking cycle for this charge of fish can be completed in 7 1/2 hours.

Drying air at 115° F. and a relative humidity of 50 percent is supplied by a mechanical air conditioning unit which reduces the air to a predetermined dew point. The drying cycle is completed in 5 1/2 hours. Hickory sawdust smoke is then drawn from the smoke generator by means of a fan and introduced into the smokehouse. The smoking operation is completed in 2 hours. The entire operation of drying and smoking is independent of daily fluctuations of temperature and humidity.

The system is fully automatic in that the operator needs only to manipulate the switches to start the equipment and thereafter the various cycles are controlled automatically by the recorder controllers.

 ABSTRACTER: Lynne G. McKee

DECOMPOSITION IN CANNED SHELLFISH

HOME-SMOKED FISH

CANNING FROZEN SALMON

AUTOMATIC SMOKING

3.4

racks will be necessary for smaller items such as shrimp. The smokehouse should be fitted with a hinged door. A few inches below the flat roof, on the sides to which the battens are nailed, cut 3 or 4 holes several inches apart about 2-inches square. These holes can be fitted with adjustable slides which will act as a draft or ventilators.

There are 2 kinds of smoking which are often combined. In the cold smoke method the temperature is kept below 100° F. and in the hot smoke method the temperature may range from 110° F. to 250° F. The fuel used in smoking should always be hardwood, such as apple or hickory. The flavor of most meat, fowl, or seafood is improved if they are placed in a brine or marinade before being smoked.

Directions for smoking shrimp, butterfish, and oysters are included.

3.4

3.30 (Cross Reference: 7.80)

3.33

Dipping thawed red-salmon and coho-salmon steaks for 1 minute in a 5-percent solution of tartaric acid before canning effectively reduced curd formation. Visual examination indicated that the surface protein was coagulated by the action of the tartaric-acid solution. This tartaric-acid treatment tended to prevent the fading of color in red salmon during canning but slightly altered the shade of color to an orange-red. This slight color change was not objectionable. Taste-panel members could not distinguish any difference in flavor between untreated samples and samples given a 1-minute dip in a 5-percent solution of the tartaric acid. Results of analyses made on canned salmon that received a 1-minute dip in a 5-percent solution of tartaric acid and on untreated canned salmon showed a total free tartaric-acid content of 0.03 percent in the cans of the salmon receiving the dip. The presence of the tartaric acid lowered the pH from 6.3 to 6.0.

Brining thawed steaks before placing them in the cans resulted in a significant reduction in curd formation. In the studies using saturated brine, the amount of curd reduction increased with the increasing duration of the dips. Of the brine treatments used, the 70-percent saturated brine and 10-minute dip gave the greatest reduction in curd.

Comparison of dips.--Although the 10-minute dip in 70-percent saturated brine produced a significant reduction in curd, it was less effective than was the 1-minute dip in 5-percent tartaric-acid solution. Shorter times with the saturated brine dips were much less efficient in reducing curd than were any of the tartaric-acid dips.

Inspection of the canned salmon prepared from the frozen fish showed that samples treated with tartaric acid never adhered to any of the cans. On the other hand, both the untreated and brined samples showed excessive sticking of the meat to the can, resulting in pieces of meat being torn from the surface when the lid was removed. Brined samples were somewhat better in this respect than were the untreated lots but were definitely inferior to the tartaric acid-dipped salmon. Thus, the tartaric-acid treatment was not only the most effective for the reduction of curd formation in canned frozen salmon, but it also eliminated sticking of the meat to the can.

6.193 UNIDENTIFIED GROWTH FACTORS IN FISH BYPRODUCTS

Sumerwell, William N. (Fishery Technological Laboratory, Seattle, Washington)
Commercial Fisheries Review 17, 11-14 (August 1955)

Concentrated fractions of the growth factor (s) in tuna livers, salmon eggs, and menhaden meals were prepared by solvent extraction, dialysis, and final purfication--either by 12-stage countercurrent distribution or by passage through ion-exchange resins. The maximum growth response produced by the various fractions were measured by means of microbiological assay in which L. casei was used.

A 35- to 45-percent maximum growth response was obtained when the crude fraction prepared by extraction and dialysis was assayed. All the raw materials--tuna livers, salmon eggs, and menhaden meals--gave about the same maximum growth response.

The fraction adsorbed on the anion-exchange resin produced a significant growth response, but there was no adsorption of growth factors on the cation column.

Efforts to prepare fish-byproduct fractions that will yield greater information as to the number of growth factors present or as to the number of modifications in chemical structure of the growth factor (s) are now in progress.

ABSTRACTER: William N. Sumerwell

6.51 TESTS OF HATCHERY FOODS FOR SALMON, 1953 and 1954

Combs, Bobby D.; Palmer, David D.; Finucane, John H.; and Burrows, Roger E.
Special Scientific Report: Fisheries No. 160, 8 pp. (August 1955)

The objective of the feeding trials was the development of adequate, economical production diets for salmon. In 1953 the program included tests for both chinook and blueback salmon fingerlings. A virus disease among the blueback salmon caused abandonment of these trials. Among the diets for chinook salmon, excellent results were obtained with 25 percent each of hog liver and arrow-toothed halibut and 50 percent salmon viscera. This economical diet was equal to the more expensive standard diet consisting of 22.2 percent each of beef liver, hog liver, and hog spleen and 33.4-percent salmon viscera. Beef lung in combination with arrow-toothed halibut and salmon viscera resulted in less growth than hog liver in the same diet. Beef lung was inferior to hog liver in the same diet. Beef lung was inferior to hog liver when combined in a diet with arrow-toothed halibut and salmon viscera. Hake was inferior to arrow-toothed halibut when combined with beef lung and salmon viscera.

In 1954 the chinook experiments attempted the development of diets containing 50-percent dry meal. The control diet consisted of 20 percent each of beef liver, hog liver, and hog spleen; 30-percent salmon viscera; 5 percent each of seal meal and distillers' solubles. A second control diet consisted of 22.5 percent each of hog liver and arrow-toothed halibut, 45-percent salmon viscera and 10 percent of the seal meal-distillers' solubles mix. The high meal diets were based on a diet developed at the Cortland, New York hatchery. In one phase of the experiments the meal mix was varied and in a second phase the meat mix. The meat-viscera diets with 10-percent meals were superior to 50-percent meal diets, using both growth and mortality as criteria. The fish receiving the 50-percent meal diets did not consume the feed normally below 50° F.

(over)

ABSTRACTER: Neva L. Karrick

6.29 EXTRACTS AND ENZYMIC HYDROLYSATES FROM FISH LIVER AND MAMMALIAN LIVER

Guttmann, A. (Atlantic Fisheries Experimental Station, Halifax, Nova Scotia)
Journal of the Fisheries Research Board of Canada 12, 637-645 (September 1955)

Purpose.--This study was made (1) to find ways to transform macerated liver tissue from which the oil had been removed into a palatable extract or hydrolyzate, which might be ingested alone or along with other foods, and (2) to determine quantitatively some of the constituents that make the liver tissue nutritionally valuable.

Materials.--Fresh whole liver from cod, haddock, and pollock; liver residue; and dried defatted liver residue was used. Liver residues were obtained from fresh livers that had been washed with water, minced with 0.04 percent by weight of sodium bisulphate, autoclaved for 15 to 20 minutes at 110° to 115° C., cooled to 70° C., and centrifuged to remove the oil. Dried, defatted liver residues were obtained from fresh liver residue, which had been dried in vacuo at 50° to 55° C., ground to 20-mesh sieve size, and extracted in a Soxhlet apparatus with ethylene dichloride.

Preparation of extracts:--Whole liver or undried liver residue was minced for 2 minutes in a Waring blender with a volume of water equal to twice the volume of liver or liver residue, acidified to pH 5 with hydrochloric acid, stirred at 80° to 85° C. for 30 minutes, and centrifuged to remove solids. The supernatant liquid or extract was made to its original volume with water and used in the extraction of a second lot of whole liver or liver residue. The double extract was then filtered and the filtrate was evaporated in vacuo at 70° C. to one-third of the original volume. One-half of the partially evaporated filtrate was further evaporated to dryness at 50° C. The other half was precipitated with an equal volume of 95 percent by volume ethanol, held overnight, and centrifuged. The resulting

(over)

ABSTRACTER: Martin Heerdt

7.1 THE STRUCTURO-MECHANICAL PROPERTIES OF BREAM MUSCLE TISSUE

Voskresensky, N. A.
Rybnoe Khozyaistvo, pp. 56-61 (May 1955) (Translated by C. N. Lee, Fishery Technological Laboratory, College Park, Maryland)

This paper gives the first results of work done in the development of an objective method for establishing the structural-mechanical properties of fish-muscle tissue. The paper can be divided into three parts.

I

The first part discusses the theoretical basis for the method. In this discussion, the author points out that three indices can be used: (1) elasticity, (2) plastic firmness, and (3) structural firmness. Elasticity indicates the capacity of the fish-muscle tissue to return to its previous dimensions after the deforming force is reduced. Plastic firmness indicates the ability of the fish-muscle tissue to withstand the action of a blunt object compressing the tissue. Structural firmness indicates the capacity of fish-muscle tissue to withstand the action of a sharp object compressing and cutting it.

II

The second part of the paper describes a device for measuring the flexibility, plastic firmness, and structural firmness of the flesh and gives formulas for the computation of the corresponding numerical values.

The device (sketch 1) is a frame with a guiding mechanism (1) into which goes a coupling rod (2) with a fitting for putting on weights (3) and a needle (4), in the upper part, and a socket (5) for the

(over)

ABSTRACTER: F. Bruce Sanford

GROWTH FACTORS IN BYPRODUCTS

NUTRITIVE VALUE OF LIVER EXTRACT

VISCERA FOR HATCHING FISH

PHYSICAL PROPERTIES OF FISH MUSCLE

6.29 (Cross Reference: 7.00)

precipitate was washed twice with 50 percent by volume ethanol and the combined supernates and washings were concentrated and dried in vacuo.

Extracts from dried defatted liver residue were prepared in the same manner except that the ratio of water to residue was 6 for the first extraction and 3 for the second.

Preparation of enzymic hydrolyzates.--Washed whole livers were minced with an equal weight of water, acidified to pH 5.5 with hydrochloric acid, warmed to 65° C., and mixed with papain equal to 1 percent of the dry weight of the fat-free livers. The mixture was then stirred continuously for 6 hours, the oil was siphoned off, and the aqueous layer was centrifuged. The solids were washed twice with water. The combined liquids were acidified to pH 6, heated to boiling, filtered, and concentrated in vacuo at 50° C. to one-third of the original volume. Fat was removed by extraction with ethylene dichloride.

Dried, defatted liver or dried, defatted liver residue was mixed with 6 times its weight of water, acidified to pH 5.5, and stirred continuously for 6 hours at 65° to 68° C. with the papain. Solids obtained by centrifuging were resuspended in half the initial amount of water, adjusted to pH 7.5, and stirred for 6 hours with pancreatin equal to 0.5 percent of the weight of the original sample. This digest was adjusted to pH 6.0, brought to boiling, cooled, and filtered. Filtrates from both enzymic digests were combined, concentrated, and dried in vacuo.

Results.--Analyses of the extracts and hydrolyzates prepared from fish livers and liver products showed that they were comparable in vitamin and mineral content to extracts and hydrolyzates prepared from mammalian sources.

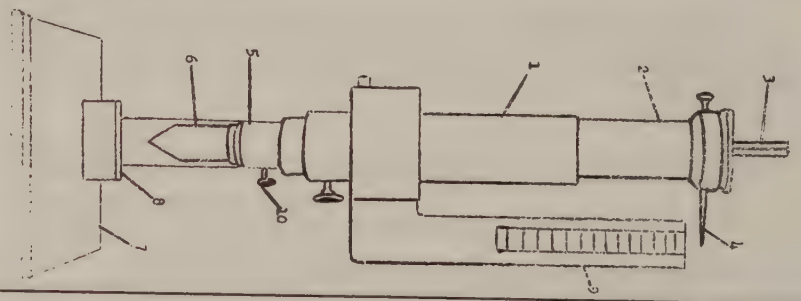
7.1 (Cross Reference 7.89)

head (6), in the lower part. The rod is held in the guiding mechanism by a special screw (10). On the base (7) is a stop piece (8) on which is placed the sample. Parallel to the guiding mechanism, on the frame of the apparatus, is the millimeter scale (9).

A round-nose-bullet-shaped head is used for measuring elasticity; a flat, dish-shaped head, for plastic firmness; and the head shown in the sketch, for structural firmness.

III

The third part of the paper reports (in two tables) the results obtained in the use of the measuring device with the breat bream of the Kur Gulf. The author found that the changes in the structural-mechanical properties of bream-muscle tissue are in full agreement with the changes in its chemical properties



6.193

6.51

The tests on blueback salmon during 1954 attempted to develop diets that were virus-free. Other workers have indicated that virus infections of blueback salmon may be carried in the food with salmon viscera as the suspect carrier. In these tests sterilized salmon viscera was evaluated. Salmon viscera was placed in cans, (a) pasteurized for 15 minutes at 50° C. and (b) cooked for 90 minutes at 100° C. The pasteurized material was kept in frozen storage. Then products were compared with raw viscera in diets. The growth produced by raw viscera was superior to that produced by either of the heat-treated products. The least growth was produced by the pasteurized viscera.

The lowered growth potential of the pasteurized and cooked viscera may be due to two factors. An obvious effect was the poorer feeding consistency of these products, allowing the feed to leach. The pasteurized viscera was worse than the cooked viscera in this respect. The second factor may be possible alteration of the protein during processing.

The second phase of these experiments fed several practical diets from which salmon viscera had been eliminated.

9.2 COORDINATION OF STATISTICS

Anonymous
Trade News 8, 7 - 8 (August 1955)

The field of fishery statistics of Canada was reviewed at a meeting in Ottawa during July 1955. No attempt was made to go into all fishery statistical problems. Instead, the meeting was restricted to a consideration of objectives and of fundamental definitions.

The primary fishing industry was defined to include: (1) all enterprises engaged in catching and landing fish, (2) enterprises engaged in closely related operations, such as collecting and carrying fish from fishing grounds to processing plants, and (3) fleet-operating divisions of processing enterprises that catch and land fish.

A fisherman was defined as anyone identified (such as skipper, partner, shareman, and employee) with a primary fishing enterprise.

Under the heading "Investment in the Primary Fisheries" the questions dealt with were as follows: (1) what is capital stock in the primary fishing industry? (2) to what extent should there be a distinction between capital stock in existence and capital stock in use? (3) how is capital stock to be valued? and (4) can data be obtained on gross new investment each year?

Capital stock.--Since the concept of capital stock has pitfalls (the definition depends upon the use to which the information is to be put), it was decided to collect quantitative and descriptive data on all items, such as vessels, gear, shore installations, and equipment.

(over)

ABSTRACTER: F. Bruce Sanford

2.9 ON THE CAUSE OF POISONING BY BIVALVE SHELLS (ON THE PROCESS OF INVESTIGATION). CHEMICAL STUDIES ON POISONOUS ELEMENT IN BIVALVE SHELL

Matsue, J.; Mori, T.; and Hashimoto, Y.
Journal of the Fisheries Research Institute, Tokyo, No. 3, 33-36, 37-43 (1950) (In English)
Food Science Abstracts 27, 28 (January 1955)

When clams (Paphia philippinarum) were cultured under certain conditions, they were found to be able to concentrate poisons such as strychnine, derived from the surrounding water, in the liver. Although clams could also concentrate copper in the same way, animal tests showed that there was no direct relationship between the formation of the poison (venerupin) and the cupric ion. Attempts were made to detect in sea water naturally occurring poisons which might be accumulated in bivalve organisms. Also, possible signs by which poisonous shellfish might be identified were studied, but results were inconclusive.

The season of occurrence, time of onset, and symptoms of the poisoning caused by venerupin and by the paralytic poison of shellfish are tabulated. Shellfish in the Uryu river channel and on the Muro Coast near its mouth were studied chemically; tests for poison were carried out upon mice. The occurrence of paralytic poison was limited to the summer and to the river bed. When non-poisonous shells were transferred from the Muro Coast to the river channel, they became poisonous, indicating that the poison is produced as a result of environmental conditions. Extraction of clams (toxic or non-toxic) with acid alcohol was found to produce an artificial poison, probably consisting of betaine derivatives; such treatment should be avoided in analytical studies of the natural poisons. Venerupin was obtained from the livers of toxic oysters by extraction with methanol, filtration, concentration of the filtrate, solution in water, and removal of fat and colored materials with ether. A similar

(over)

Reprinted in whole

9.2 TRENDS IN PRODUCTION, PROCESSING, AND DISTRIBUTION

Trigge, Charles W.
Fishing Gazette 72, 94 (August 1955)

Comparative 1954 and 1955 inventories of all varieties of fish and shellfish in the United States and Canada as of July 1 were as follows:

1954	1955	Decrease
177,968,000 pounds	171,669,000 pounds	6,297,000 pounds

July was the first month of the year that showed a decrease in total inventory in comparison with the same month of the previous year. On January 1 the inventories were 18 million pounds more than the previous year.

A four-year comparison of fillet inventories in the United States is as follows:

Species	July 1952 (pounds)	1953 (pounds)	1954 (pounds)	1955 (pounds)
Cod	12,904,785	9,948,721	9,618,000	7,194,000
Flounder	4,172,218	4,299,903	3,485,000	2,995,000
Haddock	10,282,074	11,282,400	13,616,000	10,062,000
Pollock	2,522,307	1,654,163	850,000	387,000
Ocean Perch	12,023,530	14,107,929	11,266,000	9,075,000
	41,904,914	41,293,116	38,835,000	29,713,000

Substantial quantities of cod and haddock fillets have been frozen in the form of blocks and slabs in order to take care of the demand for fish sticks. Inventories of blocks and slabs in the United States as of July 1 were 10,294,000 pounds. Inventories of breaded sticks as of July 1 were 5,524,000 pounds.

(over)

ABSTRACTER: Kathryn L. Osterhaug

9.2 U. S. COMMERCIAL FISHERIES ESTIMATED EXPENDITURES, 1954

Anonymous
Commercial Fisheries Review 17, 79 (September 1955)

Expenditures of the United States commercial fisheries in 1954 over and above the expenditures for raw materials, purchases, compensation of fishermen, direct and indirect labor, losses for depreciation and taxes, were estimated at $626 million.

In table 1, below, these expenditures are broken down according to type of business. The largest share of the total $626 million was expended by the processors and canners.

Table 2, below, and tables 3, 4, and 5, over, list the major expenditures of the vessel owners, processors and canners, wholesalers, and retailers.

Table 1 - Estimated Expenditures, of the United States Commercial Fisheries, 1954 1/

Type of Business	Value $ Million
Vessel owners	141
Processors and canners	208
Wholesalers	125
Retailers	152
Total	626

1/ Does not include expenditures for raw material, purchases, compensation of fishermen, direct and indirect labor, losses for depreciation, and taxes.

Table 2 - Fishermen Vessel Owners' Estimated Expenditures for Specified Items, 1954 1/

Item	Total Income %	Value $ Million
Total income	100	345
Estimated expenditures:		
Boat supplies and repairs	11.8	40
Fishing gear and nets	3.7	13
Ice	4.0	14
Fuel	7.2	25
Food for crew	7.5	26
Insurance	4.4	15
Other	2.4	8
Total	41.0	141

1/ Does not include depreciation, direct and indirect labor, compensation to fishermen, and taxes.

(over)

ABSTRACTER: Kathryn L. Osterhaug

COLLECTION OF FISHERY STATISTICS

FISH PRODUCTION TRENDS

POISONS IN CLAMS AND OYSTERS

COMMERCIAL FISHERIES EXPENDITURES

9.2

The following inventories of frozen shrimp for 12 months compared with the corresponding month of the previous year and the five-year average were as follows:

	1954-1955	1953-1954	5-Year Average
August	17,190,332	11,692,954	12,761,966
September	20,577,366	12,860,298	12,717,625
October	25,020,922	14,822,991	14,074,704
November	28,119,207	20,962,237	18,550,777
December	32,777,269	26,754,359	22,590,518
January	32,171,986	26,389,839	30,357,725
February	27,069,131	25,753,373	21,087,597
March	22,762,000	24,986,460	19,107,273
April	18,968,000	22,508,000	16,402,000
May	15,277,000	19,912,000	14,505,000
June	13,107,000	18,772,000	14,738,000
July	12,369,000	17,488,000	15,025,000

Bad weather and light production during the past six months resulted in reduced inventories and a gradual increase in prices.

9.2 (Cross Reference: 2.6)

Table 3 - Fishery Products Processors and Canners' Estimated Expenditures for Specified Items, 1954 1/

Item	Total Income	Value
	%	$ Million
Total income	100	580
Estimated expenditures:		
Transportation to cannery	1.2	7
Condiments	5.1	30
Insurance	1.2	7
Cans, cases, and labels	17.7	103
Repairs	1.9	11
Warehousing and freight	2.4	14
Sales, brokerage	3.1	18
Heat, light, and power	0.6	3
Advertising	1.6	9
Bank interest and miscellaneous expenses	1.0	6
Total	35.8	208

1/ Does not include depreciation, direct and indirect labor, raw material, and taxes.

Table 4 - Fishery Products Wholesalers' Estimated Expenditures for Specified Items, 1954 1/

Item	Total Income	Value
	%	$ Million
Total income	100	820
Estimated expenditures:		
Rent	1.6	13
Packaging supplies	2.0	16
Delivery expenditures	3.5	29
Refrigeration costs	1.0	8
Telephone and telegraph	0.6	5
Repairs	0.3	2
Heat, light, and power	1.8	15
Advertising	0.5	4
Insurance on buildings	0.5	4
Insurance on merchandise	0.7	6
Ice and water	0.5	4
Salesmen brokerage	1.5	12
Collection of debts and miscellaneous expenses	0.8	7
Total	15.3	125

1/ Does not include purchases, wages and salaries, depreciation, and taxes.

Table 5 - Fishery Products Retailers' Estimated Expenditures for Specified Items, 1954 1/

Item	Total Income	Value
	%	$ Million
Total income	100	1,070
Estimated expenditures:		
Rent	3.6	39
Ice and storage (warehousing)	1.4	15
Wrapping supplies	2.4	26
Delivery	1.8	19
Repairs	0.9	10
Gas and electricity	0.5	6
Telephone and telegraph	0.4	4
Insurance	0.7	7
Advertising	1.4	15
Laundry	0.7	7
Miscellaneous	0.4	4
Total	14.2	152

1/ Includes fish retailers and fish departments in combination and chain stores. Does not include purchases, depreciation, wages and salaries, and taxes.

9.2

Stock in existence. --Inasmuch as the term "stock in use" has led to confusion, this term should be replaced by "stock in existence."

Method of valuation. --The most practical approach would be to ask for market value. To insure uniformity, fishery enterprises should indicate the value of their capital assets as at a date close to the end of the calendar year. Market value should be in accord with the census definition: the amount of money that would readily transfer title from a willing seller to a willing buyer.

New investments. --Data should be collected on gross new investments, such as total annual expenditures on vessels, boats, gear, shore installations, and equipment. Gross investment should exclude minor repairs and maintenance and purchases from other fishermen but should include major alterations and imports of used equipment. Data might also be collected regarding annual expenditures on the quantities and values of requisites--such as fuel, bait, and ice--for current operations in the primary fisheries.

Other topics discussed at the meeting included statistics on the processing industry, the cold storage situation, the stocks of canned fish, and the fish catches. Special emphasis was given to the collection of statistics on the processing industry in the interior of Canada.

2.9

procedure was applied to the livers of toxic clams. When the aqueous solutions were dialysed against distilled water, most of the poison passed through the membrane, a little remained inside, and some was lost. Injections into mice indicated that the poison from clam extract which remained inside the membrane differed from the poison which penetrated the membrane. The two fractions from oyster extract appeared to be similar.

2.9 FISH -- A NEGLECTED PROTEIN FOOD

Allen, Ida Bailey
Southern Fisherman 15, 22 (October 1955)

Education of the public to the value of fish as a major protein food of great taste appeal will not only improve the diet of the average American but do so with less strain on the family food budget.

The protein of fish is of high quality, like that of meat, eggs, cheese, and milk. With the exception of milk, fish is by far the best source of calcium, phosphorous, and copper. Fish is a good source of magnesium, iron, and iodine, also, thiamin, riboflavin, and niacin. Fat fish are excellent sources of Vitamins A and D. Lean fish is excellent protein food for low cholesterol diets.

Prejudice and poor quality products can be prevented by understanding and improving fish cookery methods. Cookery suggestions offered include, (1) avoid high temperature cooking which toughens delicate fish protein, (2) maintain simmering temperature when cooking in liquid, broil 3 inches to 4 inches from source of heat, (4) sauté over a heat so moderate that no smoke rises from pan. Suggestions for seasoning and garnishing are given as well as interesting epicurean dishes to entice the housewife to try fish.

 ABSTRACTER: Thelma S. Rose

3.26 RESTAURANT FIELD IS "WIDE OPEN" FOR FROZEN FOODS, BUT "MORE EDUCATED SELLING" IS NEEDED

Anonymous
Quick Frozen Foods 18, 123-124 (December 1955)

Richard Flambert, San Francisco restaurant consultant and representative of the Golden Gate Restaurant Association, presented a five-point approach in promoting frozen food to the restaurant industry. This program was discussed by Mr. Flambert at a panel on institutional selling at the third annual Western Regional Frozen Food Convention, sponsored by the Frozen Food Distributors Association of California at the Mark Hopkins Hotel, San Francisco, October 24, 1955. It's recommendations follow:

1. Train the salesmen in the needs of the restaurant trade. Salesmen should understand restaurant production problems, practical preparation methods, and workable recipes for their frozen food items.
2. Educate the restaurant trade in what it wants to know about frozen foods. Once taught to use and purchase wisely, the industry will continue to reorder frozen foods.
3. Find out what the restaurant's storage facilities are and assist in making the best use of that space.
4. Send speakers with something concrete to offer the trade. Sell the trade so that it will be in a position to buy.
5. Coordinate thinking between packers and distributors of frozen foods.

 ABSTRACTER: Thelma S. Rose

3.19 INFLUENCES OF IONIZING RADIATIONS ON THE PROTEIN COMPONENTS OF SELECTED FOODS

McArdle, Frank J. and Desrosier, Norman W. (Purdue University, Lafayette, Indiana)
Food Technology 9, 527-532 (November 1955)

Purpose. --An objective procedure based on electrophoretic analysis was used to determine irradiation induced changes in commercial casein and egg albumin.

Procedure. --Both casein and egg albumin were irradiated in 2-percent aqueous solution at pH 7.0 with a 4 m.e.v. cathode ray from a linear electron accelerator. Molecular changes that occurred in casein and egg albumin owing to the ionizing irradiations were determined by various methods. These methods consisted of the measurement of (1) the liberation of sulfhydryl groups, (2) changes in the relative viscosity of protein solutions, (3) changes in the rate of reaction of trypsin on casein and egg albumin, and (4) changes in the electrophoretic mobilities and patterns of protein solutions.

Results. --The casein molecules were split into smaller fractions as the purified casein was irradiated in aqueous solution. Further irradiation caused the association of these molecular fractions so that complete coagulation occurred. The association effects resembled those produced by heat.

Molecules of egg albumin were transformed from globular form into an asymetrical molecule as the purified albumin was irradiated in aqueous solution. Molecular splitting did not appear to occur, but an association of transformed molecules that resulted in coagulation did occur if irradiation was prolonged. The association effects resembled those changes produced in protein by heat.

Irradiation of casein and egg albumin also increased their respective rates of trypsin hydrolysis. This increased susceptibility to the action of proteolytic enzymes plus the resistance of such food

(over)

 ABSTRACTER: Martin Heerdt

3.6 THE VACUUM CONTACT-PLATE DEHYDRATION OF FOODSTUFFS. I. A FIRST APPRAISAL. II. EQUIPMENT

Gooding, E. G. B.; Rolfe, E. J.; and Hay, J. M.
Journal of the Science of Food and Agriculture 6, 427, 432, 439 (August 1955)

Factors which must be considered in the drying of foodstuffs are discussed. The conventional hot-air drying and the vacuum contact-plate drying methods are described and compared. The latter yields better dried products than the former, both in appearance and palatability of the reconstituted, cooked material, and there is some evidence that the storage properties are also improved. Relevant factors are the absence of oxygen and the milder heat treatment of the foodstuff during vacuum contact-plate dehydration. This technique is versatile and may be used to dry a wide range of commodities, many of which cannot be dried satisfactorily by conventional methods.

On account of the lower temperatures of vaporization at reduced pressures, vacuum evaporators and dryers have for long been in use for the drying of thermally unstable materials. During the Second World War attempts were made to dehydrate foodstuffs using vacuum-drying equipment of the types then available but, except in the case of finely divided materials, the results were unsatisfactory. The equipment described in this article comprises a large steel vacuum cabinet accommodating 21 trays enabling about a ton of material to be dried per batch. The movable heating plates, arranged in such a manner as to maintain good thermal contact with foodstuff undergoing dehydration, are responsible, more than any other feature of the plant, for the successful drying of meat steaks, fish fillets, sliced root vegetables and certain whole fruits.

The plant at the experimental factory was used in the first instance mainly on the drying of fish fillets, and it was not long before it was confirmed that variations in the thickness of the layers caused

(over)

 Reprinted in part

NUTRITIVE VALUE OF FISH

EFFECT OF IRRADIATION ON PROTEINS

FROZEN FOODS FOR RESTAURANTS

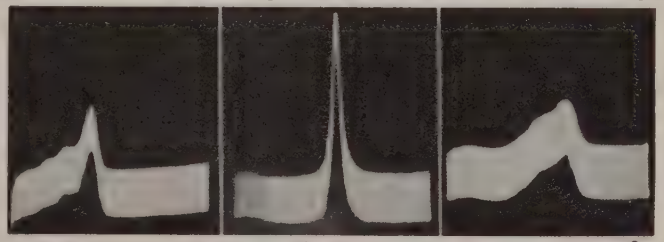
VACUUM CONTACT-PLATE DEHYDRATION

3.19

enzymes to irradiation showed that some of the changes in irradiated foods may result from the accelerated activity of naturally occurring proteolytic enzymes on the activated substrates.

All of the irradiation effects reported could be reduced simply by providing ascorbic acid in the casein and egg albumin solutions during irradiation.

Electrophoretic analysis provides an objective method for determing molecular changes that occur in proteins during irradiation. Comparisons of the changes in electrophoretic patterns and mobilities provided an objective method of evaluating the effectiveness of free radical acceptors, figure 7, below.



a. Control

b. Irradiated (1.5×10^6 rep)

c. Irradiated (1.5×10^6 rep) in presence of ascorbic acid (0.5 mg/ml)

Figure 7. The effects of cathode rays (1.5×10^6 rep) on the electrophoresis pattern and mobilities of albumen (1 percent). The protective effect of ascorbic acid. pH = 8.4; Ionic strength = 0.1; Field strength = 4.95 volt/cm.

2.9 (Cross Reference: 2.8)

3.6

wide discrepancies in the final moisture content at different points in the material, the thinner portions drying more slowly. Trouble due to this cause has been largely overcome by the use of a machine developed to cut oversize fillets down to a uniform maximum thickness. This flat cutting machine, as it has been called, comprises a serrated rubber belt on which the fillets are placed: the fillets are carried by the belt under a band knife and are held in position against the drag of the knife at the point of cutting by sharp-edged rollers which can rise and fall individually in conformity with the contours of the fish. The thin slices from the tops of the fillets can be used to make up the thickness of the layers at the tail portions.

3.26

1.0111 METHODS OF SHRIMP AND PRAWN PROSPECTING

Butler, T. H.
Fisheries Research Board of Canada, Progress Reports of the Pacific Coast Stations, No. 101, 3-5 (December 1954)

(Abstract of this article appears under 1.85 page 1 -- May 1955 issue)

1.0112 EMPLOYMENT POSSIBILITIES IN ALASKA

Hipkins, Fred W. (Fishery Marketing Specialist, Fish and Wildlife Service, Branch of Commercial Fisheries, Ketchikan, Alaska)
Pan American Fisherman 10, 4 (October 1955)

1.0141 NORWEGIAN SHRIMP FISHERY

Scattergood, Leslie
Maine Coast Fisherman 9, Section 2, 23-25 (February 1955)

"Shrimp are same species as ours but are smaller in size. Arendal shrimpers average 100 pounds a day."

1.016 SOUTH AFRICAN FISH MEAL

Anonymous
Food Manufacture 29, 167 (April 1954)

(Abstract of this article appears under 8.7 page 3 -- July 1954 issue)

1.019 COMMERCIAL FISHING PROSPECTS IN ARCTIC WATERS

Anonymous
Commercial Fisheries Review 17, 41 (October 1955)

1.1 TUNA FACTS AND PROSPECTS

Kearns, F. J.
Fisheries Newsletter 14, 11, 13, 23 (February 1955)

(Abstract of this article appears under 1.017 page 15 -- August 1955 issue)

1.2 A HISTORICAL REVIEW OF THE SHAD FISHERIES OF NORTH AMERICA

Mansueti, Romeo and Kolb, Haven
Publication No. 97, Chesapeake Biological Laboratory, Solomons, Maryland (December 1953)
Board of Natural Resources, Department of Research and Education, State of Maryland

1.80 CLAMBAKE IN A CAN

Anonymous
Food Engineering 27, 164 (October 1955)

Live lobsters and clams packed in seaweed are distributed nationally by a Damariscotta, Maine firm. Ice is packed with the seafood to protect the food. The 15- and 51- ounce tins in which the seafood is shipped are used as cooking containers after holes have been punched in the lids.

1.82 HYBRID CLAM EXPERIMENT IS PROMISING

Anonymous
Southern Fisherman 14, 160 (June 1954)

1.83 ABALONE PROCESSING

Sahyun, Melville
U. S. patent 2,688, 552 (September 7, 1954)
Chemical Abstracts 49, 538 (1955)

Abalone is separated from the shell. The meat is then put into an aq. soln. at a pH 1.0 - 3.0 containing 5 grams pepsin having a potency of 1:10,000 U.S.P. units. After standing for 30-45 min. the abalone is removed from the soln., and the dark proteinaceous matter is brushed from the white meat.

1.85 SHRIMP COCKTAIL FOR TWO

Anonymous
Food Engineering 27, 164 (October 1955)

Cocktail shrimp which are cooked in their own package are being marketed by a St. Simons Island, Georgia firm. To prepare the shrimp, the aluminum foil envelope containing eight, large, cleaned shrimp is placed unopened in boiling water for 12 minutes. Then, still sealed, the package is chilled for a few minutes. The package is opened, the shrimp rinsed and then served.

1.89 ON THE NATURE OF THE STREAMING BIREFRINGENCE OBSERVED IN THE AQUEOUS EXTRACTS OF SQUID MUSCLE. I. AN ANOMALOUS COMPONENT IN THE AQUEOUS EXTRACTS OF SQUID MUSCLE

Migita, Masao and Matsumoto, Juichiro J. (Tokai Regional Fisheries Research Laboratory)
Bulletin of the Japanese Society of Scientific Fisheries 20, No. 7,641 (1954)

1.92 TECHNOLOGICAL RESEARCH ON THE FRESHWATER FISHERIES OF THE UNITED STATES

Stansby, M. E. (Chief, Fishery Technological Laboratory, Seattle, Washington)
Commercial Fisheries Review 17, 31 (October 1955)

2.05 FOOD POISONING CAUSED BY ORDINARY PUTREFACTION. V. DETECTION OF HISTAMINE IN DETERIORATED MACKEREL PIKE. 2.

Hayashi, Makoto
J. Pharm. Soc. Japan 75, 1-4 (1955)
Chemical Abstracts 49, 5715 (1955)

Paper chromatography revealed the presence of histamine (I), tyramine, agmatine (II), arecaine (III), methylguanidine (IV), phosphorylcholine (V), and Me_3N. Adsorption chromatography through Al_2O_3 suggested the fractions working synergistically with I to cause mass poisoning included II, III, IV, and V.

2.111 NETTING AND ITS SECRETS (5) PRACTICAL TABLES WHICH GIVE CUTTING SIZES

Jeffs, F. E.
World Fishing 4, 43 (September 1955)

2.111 NETTING AND ITS SECRETS (6) SECOND ROW TAPERING

Jeffs, F. E.
World Fishing 4, 42 (October 1955)

2.112 THE TENSILE STRENGTH OF SARAN NETTING CORD OF VARIOUS TWIST

Koizumi, Takashi
Bulletin of the Japanese Society of Scientific Fisheries 20, 569 (1953) (English summary and figures)

The shrinkage, the diameter and the tensile strength of 2/4 and 3/6 netting cords of various twists and made with 100D x 12 Saran (yellow) yarns of 50 cm. long, were measured.

2.1125 MODEL EXPERIMENTS ON THE SARDINE PURSE SEINE OPERATING IN HIUGANADA. I.

Iitaka, Yunosuke
Bulletin of the Japanese Society of Scientific Fisheries 20, No. 7, 571 (1954) (English summary, table, and figures)

A series of model experiments were conducted for the purpose of disentangling a purse seine net that had become entangled by a strong underwater current.

2.1126 JAPANESE HIGH-SEAS MOTHERSHIP-TYPE DRIFT GILL NET SALMON FISHERY -- 1954

Fukuhara, Francis M.
Commercial Fisheries Review 17, 1-12 (March 1955)

(Abstract of this article appears under 2.118 page 15 - August 1955 issue)

2.116 NORWEGIAN APPROACH TO ECHO-SOUNDING. USE OF RECORDING SOUNDERS IN ACCURATE ESTIMATES OF SHOALS

Anonymous
World Fishing 4, 37 (December 1955)

2.14 SOOKE TRAPS ARE STILL POTENT GEAR

Kidd, Gerry
Western Fisheries 50, 14 (September 1955)

2.9 FISH POISONING AND ITS CAUSES

Schmidt, G.
Fette, Seifen, Anstrichmitt 56, 525-527 (1954)
Food Science Abstracts 27, 396 (July 1955)

The common causes of poisoning due to the consumption of fish are shown to be relatively few. An important role is ascribed to intoxication caused by industrial waste containing toxic chemicals, which can accumulate in the fat of river and lake fishes. Phenolic derivatives especially are readily absorbed and stored in the fish fat.

2.9 COMPOSITION OF FOODS. RAW, PROCESSED, PREPARED

Watt, Bernice K. and Merrill, Annabel L.
Agriculture Handbook No. 8, U. S. Department of Agriculture

3.12 ANTIBIOTICS IN FOOD PRESERVATION

Campbell, L. Leon and O'Brien, R. T. (State College of Washington, Pullman, Washington)
Food Technology 9, 461 (September 1955)

A review of the literature on the application of antibiotics in food preservation. Seventy-five references are cited.

3.19 THE USE OF ULTRA-VIOLET LIGHT TO EXTEND THE KEEPING QUALITY OF SMOKED FISH

Zschorowski, T.
Przem. Rol. Spoz. 8, 357-361 (1954)
Food Science Abstracts 27, 379 (July 1955)

Exposure to ultra-violet light markedly retards the growth of bacteria on fish, but has little effect on fungal spores. With lean fish, the best results were obtained by direct exposure; for fatty fish, it was best to irradiate either the wrapping or the surfaces in the store.

3.26 THE DEVELOPMENT OF A SOLID-ABSORPTION REFRIGERATING MACHINE FOR USE ON TRAINS

Andrews, H. I.
Modern Refrigeration 58, 330 (September 1955)

3.249 THE INFLUENCE OF FREEZING AND FROZEN STORAGE ON THE APYRASE ACTIVITY OF FISH AND BEEF MUSCULATURE

Partmann, W.
Z. Lebensmitt. -Untersuch. u. -Forsch. 99, 341-346 (1954)
Food Science Abstracts 27, 381 (July 1955)

The adenosinetriphosphatase activity was studied in 1-g samples of muscle tissue taken from the gastrocnemius muscle of beef cattle or from the body wall of tench.

3.26 REFRIGERATED TRUCK LINES EQUIPPED TO HANDLE FROZEN FOOD SHIPMENTS

Anonymous
Quick Frozen Foods 18, 99 (November 1955)

3.26 CRUSHING DRY ICE BLOCKS CAN SAVE UP TO 1 1/2 CENTS/LB. OVER SLABS

Anonymous
Food Processing 16, 42 (October 1955)

3.33 JELLIED SALMON

Anonymous
Commercial Fisheries Review 17, 40 (October 1955)

3.338 PROTECTIVE PACKAGING OF FOODS AGAINST MOISTURE CONDENSATION

Woodroof, J. G. and Heaton, E. K. (Department of Food Processing, Georgia Experiment Station, Experiment, Georgia)
Food Technology 9, 510 (October 1955)

Effects of condensation on corrugated cartons, the glue used for closure, labels, and can surface were observed when canned vegetables were packed in cartons of 26 constructions and removed from 32° F. and 75 percent relative humidity to 70° F. and 95 percent r.h. Condensation on most of the packages caused carton fatigue, weakening of the glue, wrinkling and staining of labels, and rusting of cans. But perfect protection was obtained by the use of cartons with aluminum foil on the inside and outside surfaces, with corrugated pads on top and bottom of the cans, and cartons closed by glue plus the use of six strips of waterproof tape. Can rusting was related to the temperature and occurred only in the presence of water in the liquid phase.

3.5 THE MICROBIOLOGY OF CURED AND FROZEN FISH

Shewan, J. M
Symposium on cured and frozen fish technology, Swedish Institute for Food Preservation Research, Goteborg, No. 100, Chapter 2, 18 pp. (November 1953)

(Abstract of this article appears under 0.5 page 1 -- December 1955 issue)

3.5 STUDIES ON THE INFLUENCES OF SALT ON MICROBIAL METABOLISM. III. ON THE RELATION OF SALT CONCENTRATION TO THE PUTREFACTION OF FISH MUSCLE AND TO RIPENING OF "IKA-SHIOKARA". IV. SOME CHEMICAL OBSERVATIONS IN THE COURSE OF RIPENING OF "IKA-SHIOKARA"

Nagasaki, Susumu and Yamamoto, Tatsuo (Chemical Laboratory of Fisheries, Kochi University)
Bulletin of the Japanese Society of Scientific Fisheries 20, No. 7, 613, 617 (1954) (English summary, figures, and table)

3.6 THE BACTERIOLOGY OF DEHYDRATED FISH. II. OBSERVATIONS AND EXPERIMENTS MADE DURING SMALL-SCALE COMMERCIAL PRODUCTION

Shewan, J. M.
Food Science Abstracts 27, 133 (March 1955)

(Abstract of this article appears under 2.01 page 7 -- December 1955 issue)

3.64 INSECT PENETRATION OF FILMS

Gerhardt, Paul D. and Lindgren, David L.
Modern Packaging 28, 216-219 (April 1955)

(Abstract of this article appears under 6.14 page 13 -- October 1955 issue)

4.11 DEVELOPMENT OF A SIMPLE METHOD FOR THE FRACTIONATION AND ANALYSIS OF MONO- AND DIGLYCERIDE MIXTURES

Privett, O. S.
Annual Report of The Hormel Institute, University of Minnesota, pp. 17-21 (1954-1955)

4.11 APPLICATION OF CHROMATOGRAPHY TO SEPARATION PROBLEMS IN THE LIPID FIELD

Holman, Ralph T.
Annual Report of the Hormel Institute, University of Minnesota, pp. 33-37 (1954-1955)

Chromatography has been used to isolate pure lipid constituents and to develop quantitative methods for the analysis of lipids from polyunsaturated fatty acids.

4.11 FATTY ACIDS COMPOSITION OF SAURY OIL BY SPECTROPHOTOMETRIC METHOD

Tsuchiya, Yasuhiko and Mitsu, Kayama (Department of Fisheries, Faculty of Agriculture, Tohoku University, Sendai, Japan)
Tohoku Journal of Agricultural Research 5, 269-276 (March 1955)

The problems of the assumptions arisen from applying the spectrophotometric method to the marine oils are discussed.

LIST OF PUBLICATIONS REGULARLY ABSTRACTED

Analyst
Analytical Chemistry
Archives of Biochemistry and Biophysics
Biochemical Journal
Bulletin of the Faculty of Fisheries, Hokkaido University
Bulletin of the Japanese Society of Scientific Fisheries
California Fish and Game
Canadian Fisherman
Canadian Journal of Chemistry
Canadian Journal of Technology
Canner
Chemical Abstracts
Chemical and Engineering News
Chemical Engineering
Chemistry and Industry
Commercial Fisheries Review
Drug and Cosmetic Industry
FAO Fisheries Bulletin
Federation Proceedings
Feedstuffs
Fisheries Newsletter (Australia)
Fish. Res. Bd. Can., Prog. Repts. Atlantic Coast Stas.
Fish. Res. Bd. Can., Prog. Repts. Pacific Coast Stas.
Fisherman
Fishing Gazette
Flour and Feed
Food Engineering
Food Manufacture
Food Packer
Food Preservation Quarterly
Food Processing
Food Research
Food Science Abstracts
Food Technology
Frosted Food Field
Industrial and Engineering Chemistry
Industrial Refrigeration
Journal of Agricultural and Food Chemistry
Journal of Applied Chemistry
Journal of Biological Chemistry
Journal of Home Economics
Journal of Nutrition
Journal of the American Chemical Society
Journal of the American Dietetic Association
Journal of the American Oil Chemists' Society
Journal of the Association of Official Agricultural Chemists
Journal of the Fisheries Research Board of Canada
Journal of the Science of Food and Agriculture
Maine Coast Fisherman
Meldinger Fra SSF (Herring Industry, Norway)
Modern Packaging
Modern Refrigeration
National Fisherman
National Provisioner
Nature
Nutrition Reviews
Pacific Fisherman
Pan American Fisherman
Poultry Science
Practical Home Economics
Progressive Fish-Culturist
Quick Frozen Foods
Refrigerating Engineering
Report of the Food Investigation Board (Great Britain)
Science
Southern Fisherman
Trade News (Fisheries Department, Canada)
Western Fisheries
World Fishing

Articles chosen for abstracting or inclusion as bibliographical references are those deemed of interest to the commercial fisheries and to fishery technological laboratories. Occasionally pertinent articles from sources other than the above listed publications are included. Biological papers are generally omitted.

4.14 STUDIES ON THE PIGMENTS OF WHALE OIL. VII. PYRROLIC COMPOUNDS IN THE PIGMENT

Mukai, Katsunori
Bulletin of the Japanese Society of Scientific Fisheries 20, No. 7, 610 (1954) (English summary, tables and figures)

The pyrrole ring is present but porphyrin nucleus is absent both in whale oils and in the pigments.

4.15 STUDIES ON UTILIZATION OF THE LIVER OIL OF THE DEEP SEA SHARKS. VIII. HYDROCARBON CONTENT IN THE LIVER OIL OF "KINDENZAME" (CENTROPHORUS SP.) IX. THE RELATION BETWEEN HYDROCARBON CONTENT IN LIVER OIL OF MALE OF "YUMEZAME", (CENTROSCYMNUS OWSTONI) GARMAN AND THEIR MILT WEIGHT. X. HYDROCARBON CONTENT IN LIVER OIL OF VARIOUS DEEP SEA SHARKS AND ITS RELATIONSHIPS WITH SPECIFIC GRAVITY, REFRACTIVE INDEX AND UNSAPONIFIABLE MATTER CONTENT

Higashi, Hideo; Kaneko, Tokujoro; and Sugii, Kisaburo
Bulletin of the Japanese Society of Scientific Fisheries 20, No. 7, 625, 627, 633 (1954) (English summary, tables, and figures)

4.3 SOLUBILITIES OF FATTY ACIDS AND DERIVATIVES IN SEVERAL SOLVENTS

Norcia, Leonard N. and Privett, Orville S.
Annual Report of the Hormel Institute, University of Minnesota, 37-40 (1953-1954)

All -cis linoleate has been prepared in quantity by a urea complex fractionation technique. All -cis linoleate has been prepared by combined urea-complex fractionation and chromatography and also by fractional crystallization. The latter method appears to be the more practicable for large-quantity preparations.

4.7 U. S. SURPLUSES OF OILS AND FATS IN WORLD MARKETS

Burtis, E. L. (Food and Agriculture Organization of the United Nations, Washington, D. C.)
Journal of the American Oil Chemists' Society 32, 26 (October 1955)

A moderate increase in fats and oils production seems likely in the next two years. Exportable supplies of oils and fats from the United States in the next few years are likely to remain at 3.0 billion pounds or more per year. U. S. fats and oils industries as a whole, will be dependent on export outlets for nearly one-fourth of their marketings.

4.7 TALL OIL GETS TALLER

Anonymous
Chemical and Engineering News 33, 4456 (October 17, 1955)

"Tall oil, the byproduct which once created pollution problems for the sulfate pulp industry, is becoming a tough competitor among raw materials which serve the synthetic coatings industry. Its drying oils uses alone have risen from 2 million pounds in 1943 to 110 million in 1954."

4.90 PHYSIOLOGICAL PROPERTIES OF THE SAPONIFIABLE FRACTION OF FISH AND WHALE OILS

Creac'h, P.
Oléagineux 10, 161-168 (1955) A review.
Food Science Abstracts 27, 422 (July 1955)

Fish and whale oils are characterized by a high content of polyethylenic C_{20} and C_{22} fatty acids, with double bonds often 4 carbon atoms apart. The oils are highly digestible. When consumed by young animals, fish and whale oils increase the requirement for vitamin E, and in sufficient amounts are actively toxic. They decrease the fat content of the milk of lactating animals, and give a disagreeable flavor to meat-producing animals. The unsaponifiable fraction of the oils, which is rich in vitamins A and D, does not have these adverse affects. Oxidized oils (containing peroxides) are more toxic than those of good quality. Hydrogenated oils are not toxic, and are valuable foods. Polymerized oils are in some cases only partly absorbed. Human subjects can safely consume proportionately more fish or whale oil than can domestic animals.

4.92 NUTRITIVE VALUE OR TOXICITY OF OILS OF SALTED AND DRIED FISHES

Kaneda, Takashi; Sakai, Hisae; and Ishii, Seinosuke
Bulletin of the Japanese Society of Scientific Fisheries 20, No. 7, 664 (1954) (English summary, tables, and figures)

The nutritive value of oils of salted-dried fishes is influenced by degree of autoxidation, and if the original oil shows a high iodine number, the nutritive value becomes lower.

4.92 STUDIES ON THE NUTRITIVE VALUE OF LIPIDES. XII. NUTRITIVE VALUE OR TOXICITY OF HIGHLY UNSATURATED FATTY ACIDS (3)

Kaneda, Takashi; Sakai, Hisae; and Ishii, Seinosuke
Bulletin of the Japanese Society of Scientific Fisheries 20, No. 7, 658 (1954) (English summary, tables, and figures)

The authors liberated the peroxide of autoxidized highly unsaturated acids by Lea's peroxide-determination method. These acids then became "non-toxic", and showed nutritive effects upon the growth of rats.

5.111 CRUSTACEAN VITAMIN A

Wald, George and Burg, Stanley P. (Biological Labs. of Harvard University, Cambridge)
Federation Proceedings 14, Part I, 300 (March 1955)

INDEX

Subject	Page No.	Card No.
Analysis, organic		
Methods for analysis of lipids	25	4.11
Analysis of mono- and diglycerides	25	4.11
Spectrophotometric fatty acid assay	25	4.11
Protein determination in herring	29	7.51
Fat determination in herring	29	7.53
Analysis, vitamins, B-complex vitamins		
Vitamin B_{12} assay	29	7.461
Canned fish, general		
Russian canned seafood	11	3.30
Decomposition in canned shellfish	13	3.30
Canned fish, containers		
Moisture protection for canned food	25	3.338
Canned fish, processing		
Canning frozen salmon	13	3.33
Jellied salmon and tuna	25	3.33
Cod family		
Sterile cod muscle free amino acids	3	1.5
Composition, vitamins		
Seasonal variation in vitamin A	29	8.6170
Vitamin A in marine crustacea	29	8.6170
Provitamin A in haddock-liver oil	29	8.6175
Dried and dehydrated fish		
Vacuum contact-plate dehydration	19	3.6
Economics and statistics		
Collection of fishery statistics	17	9.2
Fish production trends	17	9.2
Commercial fisheries expenditures	17	9.2
European fisheries, Scandinavia		
Norwegian shrimp fishery	21	1.0141
Exploratory fishing		
Bluefin tuna exploration	7	2.12
Fish liver oils, manufacturing of		
Nutritive value of liver extract	15	6.29
Fish meal, nutritive value		
Growth factors in byproducts	15	6.193
Fishing methods		
Traps still potent gear	23	2.14
Freshness of fish		
Physical properties of fish muscle	15	7.1
Color test for fish freshness	29	7.81
Fresh-water fish		
Fresh-water fish research	21	1.92
Frozen fish, changes in during freezing and cold storage		
Effect of -10° to +10° F. storage	11	3.249
Effect of freezing on apyrase enzyme	25	3.249
Frozen fish, packaging		
Frozen waxed meat	11	3.238
Frozen fish, processing		
Frozen fillets in jelly	9	3.230
Application of automation	9	3.231
Frozen fish dishes	11	3.235
Gear, fishing		
Study of trolling lures	3	2.1127
Fisheries radio network	5	2.116
The "fish finder"	5	2.116
Netting and its secrets	23	2.111
Secrets of netting	23	2.111
Strength of saran net cord	23	2.112
Sardine purse-seine experiments	23	2.1125
Use of recording sounders	23	2.116
Handling fresh fish		
Chilled sea-water holding system	7	2.15
Herring and similar species		
Shad fisheries of North America	21	1.2
Lobsters		
Clambake in a can	21	1.80
Marine plant products		
Plate-type heat exchanger	29	6.3
Seaweed symposium	29	6.3
Marketing		
Market testing	9	2.6
Frozen foods for restaurants	19	3.26
North America, Alaskan fisheries and U. S. Territories		
Fishery employment in Alaska	21	1.0112
Nutritional value of fish and toxicity		
Histamine poisoning in spoiled fish	7	2.9
Poisons in clams and oysters	17	2.9
Nutritive value of fish	19	2.9
Composition of foods	23	2.9
Toxic chemicals in fish	23	2.9
Nutritional value of fishery byproducts other than meal		
Viscera for hatching fish	15	6.51
Oils, chemical and physical properties		
Pyrroles in whale oil pigments	27	4.14
Shark liver oil composition	27	4.15
Solubilities of fatty acids	27	4.3
Oils, nutrition		
Nutritional status of fish oils	27	4.90
Toxicity of oils from dried fish	27	4.92
Toxicity of unsaturated fatty acids	27	4.92
Oils, utilization and marketing		
New markets for tall oil	27	4.7
Surplus U. S. oils in world markets	27	4.7
Preservatives and sanitation		
Plant sanitation	9	2.3
Effect of irradiation on proteins	19	3.19
Antibiotics in food preservation	23	3.12
Ultra-violet light retards bacteria	23	3.19
Rockfish and rosefish		
Freezing rockfish	1	1.4
Salt fish		
Salt versus muscle putrefaction	25	3.5
Sardines		
Sardine research lab	1	1.20
Sea cucumber meat		
Proteins of sea cucumber meat	5	1.9
Shellfish and crustaceans, miscellaneous		
Hybrid clam experiment	21	1.82
Abalone processing	21	1.83
Squid muscle extract birefringence	21	1.89
Shrimp		
Shrimp peeler	1	1.85
Shrimp in foil	21	1.85
Smoked fish		
Automatic smoking	13	3.4
Home-smoked fish	13	3.4
Spoilage		
Detection of histamine in fish	23	2.05
Transportation		
Crushed dry ice	25	3.26
Refrigeration on trains	23	3.26
Frozen food truckers	25	3.26
Tuna		
Offshore albacore fishery	1	1.10
Vitamins, vitamin A, chemistry		
Crustacean vitamin A	27	5.111
Vessels, fishing		
Fishery boats of the world	3	2.11
Small craft design	3	2.115
Diesel-electric trawler	5	2.117
Tuna clipper design	7	2.117
World fisheries and miscellaneous oceanic fisheries		
Fishing arctic waters	21	1.019

6.231 RAPID LIQUID-LIQUID EXTRACTION WITH CENTRIFUGAL UNIT

Anonymous
Chemical Processing 17, 138-139 (May 1954)

(Abstract of this article appears under 6.133 page 7 -- July 1954 issue)

6.3 SECOND INTERNATIONAL SEAWEED SYMPOSIUM IN TRONDHEIM 1955

Jensen, Arne
Norwegian Fishing News 2, 4 (1955)

6.3 PLATE-TYPE HEAT EXCHANGER GIVES 5 TIMES MORE COOLING AT SAME PRODUCT FLOW RATE AND WITH LESS THAN HALF THE COOLING SURFACE

Fogg, Neal F. (Algin Corporation of America)
Food Processing 16, 72, 73 (October 1955)

7.461 REPORT ON VITAMIN B_{12} (MICROBIOLOGICAL METHOD)

Krieger, Carl H. (Wisconsin Alumni Research Foundation, Madison, Wisconsin)
Journal of the Association of Official Agricultural Chemists 38, 711 (August 15, 1955)

7.51 PROPOSAL FOR THE INTRODUCTION OF A NEW NITROGEN FACTOR FOR THE CALCULATION OF THE PROTEIN CONTENT OF THE EDIBLE PORTION OF THE HERRING

Brandes, C. H. and Dietrich, R.
Fette, Seifen, Anstrichmitt. 56, 499-503 (1954)
Food Science Abstracts 27, 405 (July 1955)

The protein-water line and the fat-water line for the edible portion of herring are presented as a single graph. This permits the fat content as well as the protein content to be calculated with a fair degree of accuracy, on the basis of a single determination of water, provided that the salt content of the raw material does not exceed 0.4 percent.

7.53 (Cross Reference: 1.2)

THE DETERMINATION OF THE FAT CONTENT IN WHOLE UNGUTTED HERRINGS, ON THE BASIS OF THE CORRELATION BETWEEN FAT AND WATER

Brandes, C. H. and Dietrich, R.
Fette, Seifen, Anstrichmitt 56, 495-499 (1954)
Food Science Abstracts 27, 405 (July 1955)

The fat and water contents of individual whole herring from different fishing areas were determined.

Using the water-fat correlation coefficient, the corresponding regression was developed and compared with the fat-water (FW) line. In the range of maximal water content these two lines differ only slightly. It is practicable on the basis of a single water determination, to calculate the fat content for the whole herring, using the new FW line.

7.81 A NEW COLOR TEST FOR THE MEASUREMENT OF FRESHNESS OF FISH BY VOLATILE BASES ESTIMATION

Tsuchiya, Tasuhiko and Kayama, Mitsu
Tohoku Journal of Agricultural Research V, 37 (September 1954)

The volatile bases given off from the water extract sample in the lower chamber of a small Petri dish are caught by an absorber paper holding a known quantity of standard acid solution with neutralization indicators in the upper lid, and then estimated by means of the color change of the indicator in acid absorber in comparison with the table of standard color.

7.86 THE BACTERIAL REDUCTION OF TRIMETHYLAMINE OXIDE TO TRIMETHYLAMINE

Tarr, H. L. A.
Journal of the Fisheries Research Board of Canada 4, 367-377 (February 1940)

(Abstract of this article appears under 2.01 page 17 -- October 1954 issue)

7.872 SOME OBSERVATIONS ON EXTRACTION AND IODINE VALUES OF FAT FROM FISH TISSUE, PRESS CAKE AND MEAL, AND ON PEROXIDE VALUES OF MEAL FAT THE FIRST DAY

Olafsson, Pall
Timarit Verkfraeoingafelags Islands 38, No. 4 (1953)

(Abstract of this article appears under 6.14 page 9 -- November 1954 issue)

8.6170 FISH-LIVER OILS. I. SEASONAL VARIATION IN VITAMIN A CONTENT AND SOME OF THE PHYSICAL AND CHEMICAL CONSTANTS OF SOME FISH-LIVER OILS

Das, B. R. S.; Acharya, B. N.; and Devadatta, S. C.
Proc. Indian Acad. Sci. 29B, 13-22 (1949)
Chemical Abstracts 43, 5210 (1949)

8.6170 VITAMIN A AND CAROTENOIDS IN CERTAIN INVERTEBRATES. I. MARINE CRUSTACEA

Fisher, L. R.; Kon, S. K.; and Thompson, S. Y.
Journal Marine Biol. Assoc. United Kingdom 31, 229-258 (1952)
Chemical Abstracts 47, 2891 (1953)

8.6175 PROVITAMIN A IN HADDOCK LIVER OIL

Mocoroa, F.
Anales fis. y. quim. (Madrid) 40, 597-604 (1944)
Chemical Abstracts 44, 802 (1950)

Haddock liver oil contains 5000-6000 international units vitamin A/g. and a provitamin A which is transformed into vitamin A by the action of light.

INT.-DUP. SEC., WASH., D.C. 94273

United States
Department of the Interior
Fish and Wildlife Service
Washington 25, D. C.

Official Business